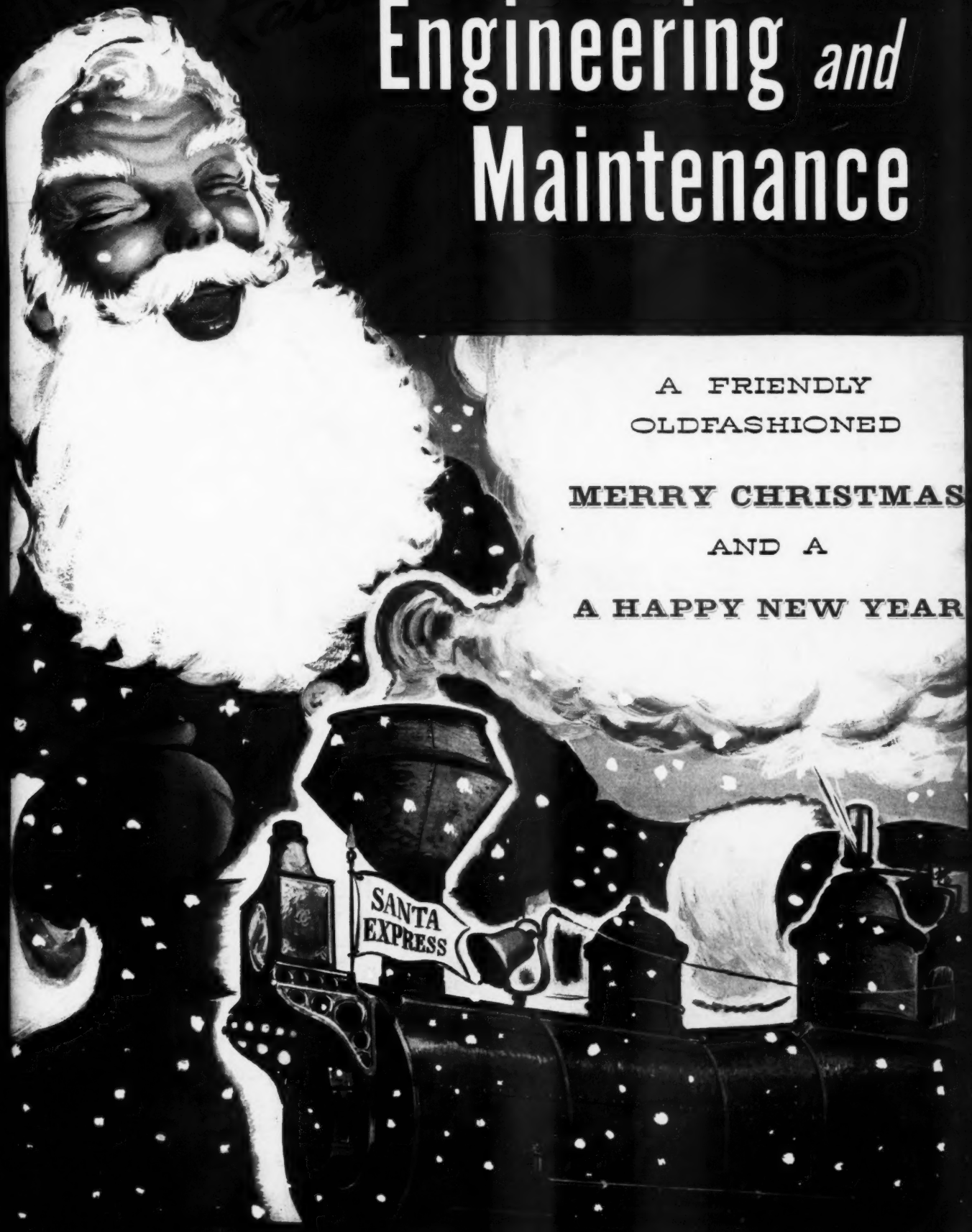
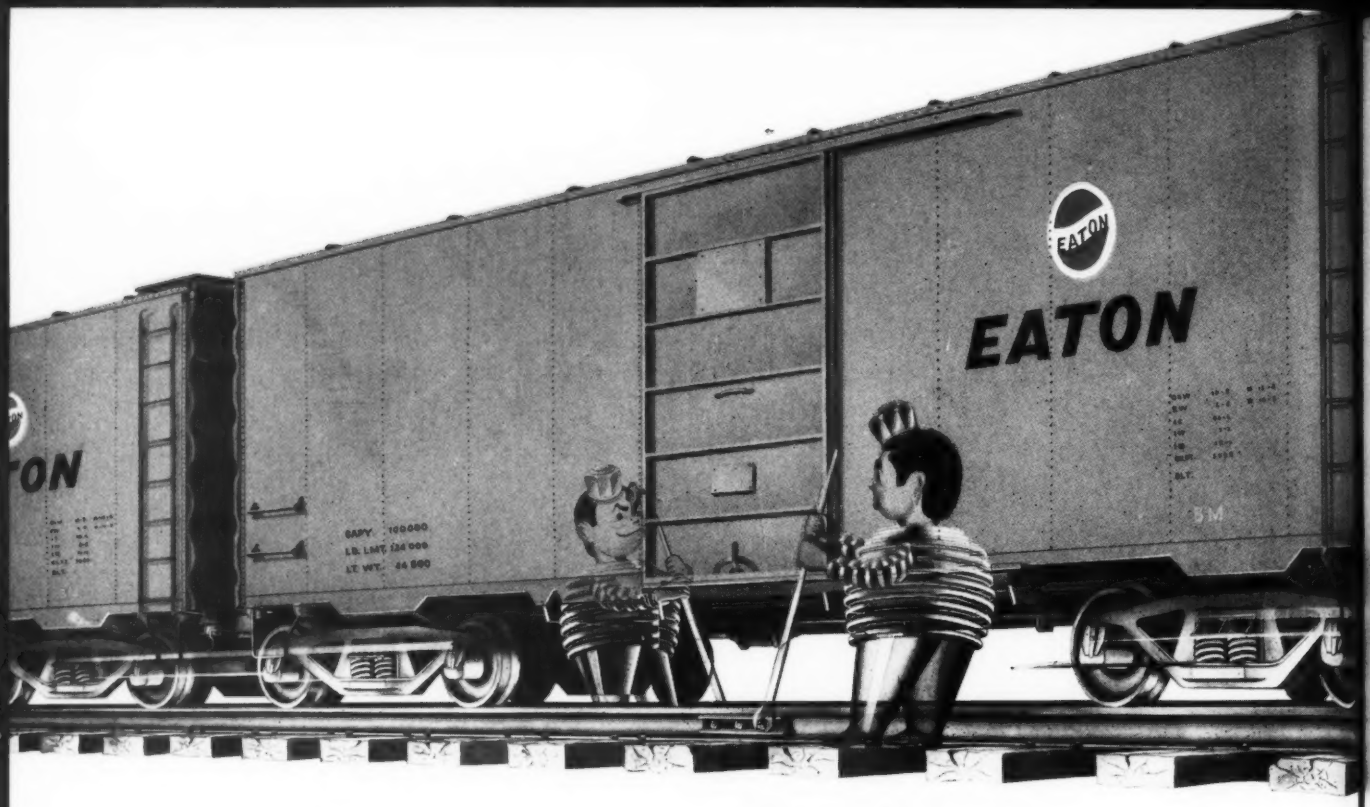
Engineering and Maintenance



HE NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.



"Maintenance Men" who are always on the Job

- Reliance Hy-Pressure Hy-Crome Spring Washers on track joint bolts are equal to a 24-hour maintenance service.
- They don't even step aside to let the limited go by. Their powerful coil-spring reactive force over an adequate range keeps the threaded parts under constant tension—in traffic or out—instantly, automatically compensating for developed looseness.
- Less frequent maintenance tightening is necessary and, since tight joints deteriorate slowly, less costly rail-end and joint bar treatment is required, keeping track open for speedy delivery of vital material for our nation's defense.
- Whatever the service conditions, whatever the bolt size, there's a Reliance Hy-Pressure Hy-Crome Spring Washer made specifically for the application—scientifically designed, fabricated from special-analysis cold drawn alloy spring steel and uniformly heat treated to develop maximum non-fatiguing reactive force.
- That's why you can count on lower maintenance costs when you use Reliance Hy-Pressure Hy-Crome Spring Washers.

The Edgemark Of Quality

EATON

RELIANCE HY-PRESSURE HY-CROME SPRING WASHERS

EATON MANUFACTURING COMPANY

RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, one year $2.00 (special rate to railroad employees only, one year $1.00). Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 47, No. 12.

PERFORMANCE INSURANCE for DIESELS

ONLY

DRY FUEL

GETS THRU THE

BOWSER UNI-PASS

Capacities up to 600 g.p.m.

● When injectors stick . . . sometimes breaking the control shafts . . . chances are there's moisture in your diesel fuel! It also causes faster carbon formation, inefficient ignition and loss of power.

And if enough steam is generated, it can even explode a cylinder!

In a single pass the Bowser UNI-PASS removes every drop of water from diesel fuel before it goes to the locomotive.

May we explain how it works? Write for complete data.

BOWSER ESTABLISHED 1885

BOWSER, INC., 1323 CREIGHTON AVENUE, FORT WAYNE 2, INDIANA

LIQUID CONTROL SPECIALISTS SINCE 1885

Here's what WE mean by

EASY TO SERVICE

Allis-Chalmers' new tractor line is blazing the way to simpler servicing with time and money savings never before possible.

Adjustments are easier . . . lubrication simplified and lube periods greatly extended. Mechanics say these are the easiest tractors they have ever worked on!

This all adds up to less down time, more producing time...longer tractor life at less upkeep cost.

Following are just a few reasons why this NEWEST, FINEST TRACTOR LINE ON EARTH is *Easy To Service*...besides being built to "take it," easy to operate and entirely new in performance. Get the full story from your Allis-Chalmers dealer.

TIME-SAVING LUBRICATION DESIGN — Only a few lube points, easy to get at — NONE UNDER TRACTORS. You operate *75 HOURS* without any greasing — then only one fitting to hit and an oil change to make. (Only exception, torque converter bearings on HD-20). You lubricate the Positive-Seal truck wheels, support rollers and idlers only once every *1,000 HOURS!*

ACCESSIBLE ADJUSTMENTS — *QUICKLY MADE* — brakes, master clutch, steering clutches. No floor plates to remove for any adjustments. Tracks easier to adjust — simple screw adjustment with automatic lock.

EASY TO REPAIR — Engine, master clutch, transmission, steering clutches and final drives can be easily removed and repaired or replaced, *without disturbing adjacent assemblies.*

ALLIS-CHALMERS

TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

The Newest, Finest Tractor Line on Earth!

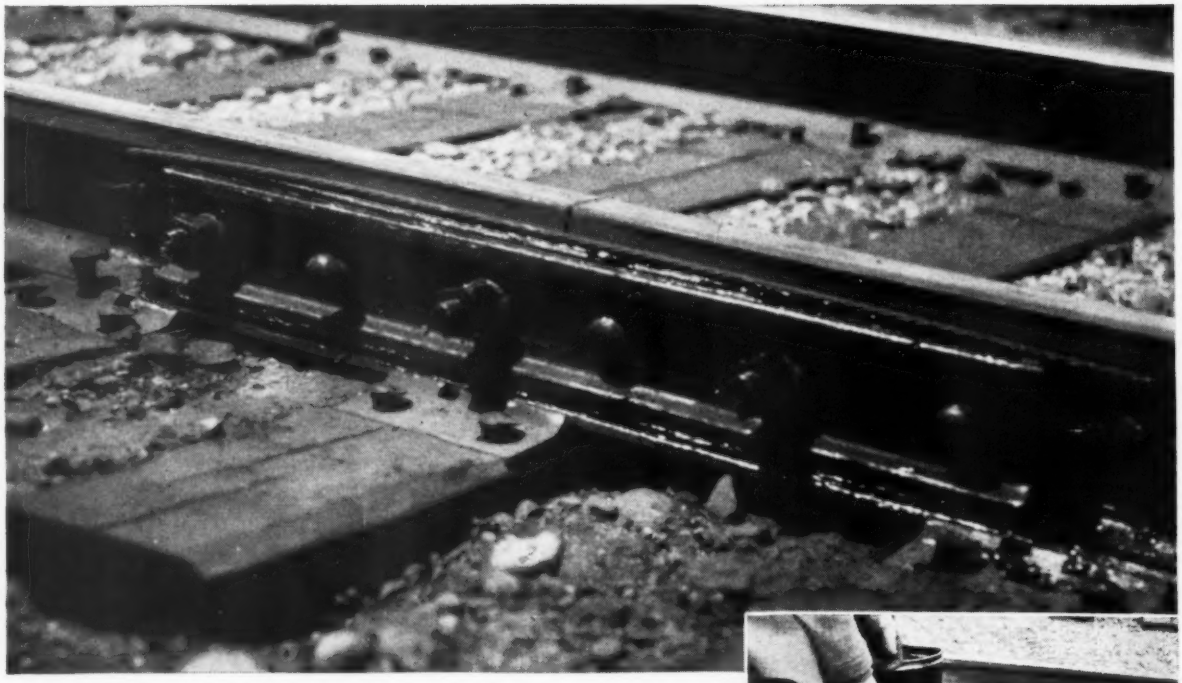
40.26 drawbar hp.
11,250 lb.

70 drawbar hp.
18,800 lb.

102 drawbar hp.
27,850 lb.

Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

- DESIGNED FOR YOUR JOB
- BUILT TO "TAKE IT"
- EASY TO OPERATE
- EASY TO SERVICE



how to protect rail joints with NO-OX-ID

NO-OX-ID "A Special" gives long-term protection against corrosion when applied on new rails and where joint bars are changed out. Properly applied, NO-OX-ID "A Special" non-drying coating will prevent freezing of the rail joint. Adds years to normal service life at a lower maintenance cost.

The outstanding weathering qualities of NO-OX-ID, its resistance to moisture penetration, and ease of application make it "standard" with maintenance of way men on many leading railroads.

We will gladly tell you more about NO-OX-ID "A Special," the efficient coating that stops rust. The coupon is for your convenience.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

Easy, Inexpensive to Apply

1. Using a wooden-backed wire brush in each hand, workman removes loose scale on both sides of the rail in one operation.
2. A sufficient quantity of NO-OX-ID is placed on each side of rail, using a dipper or ladle.
3. The NO-OX-ID is then brushed on the rail ends with a two-knot roofing brush.

This application method assures good bond of NO-OX-ID on the rail.

Write for complete instructions on how to apply NO-OX-ID "A Special"

Dearborn Chemical Company
Merchandise Mart Plaza, Dept. RE
Chicago 54, Illinois

Please send me bulletin on "How to Protect Rail Joints Using NO-OX-ID."

Name.....

Company.....

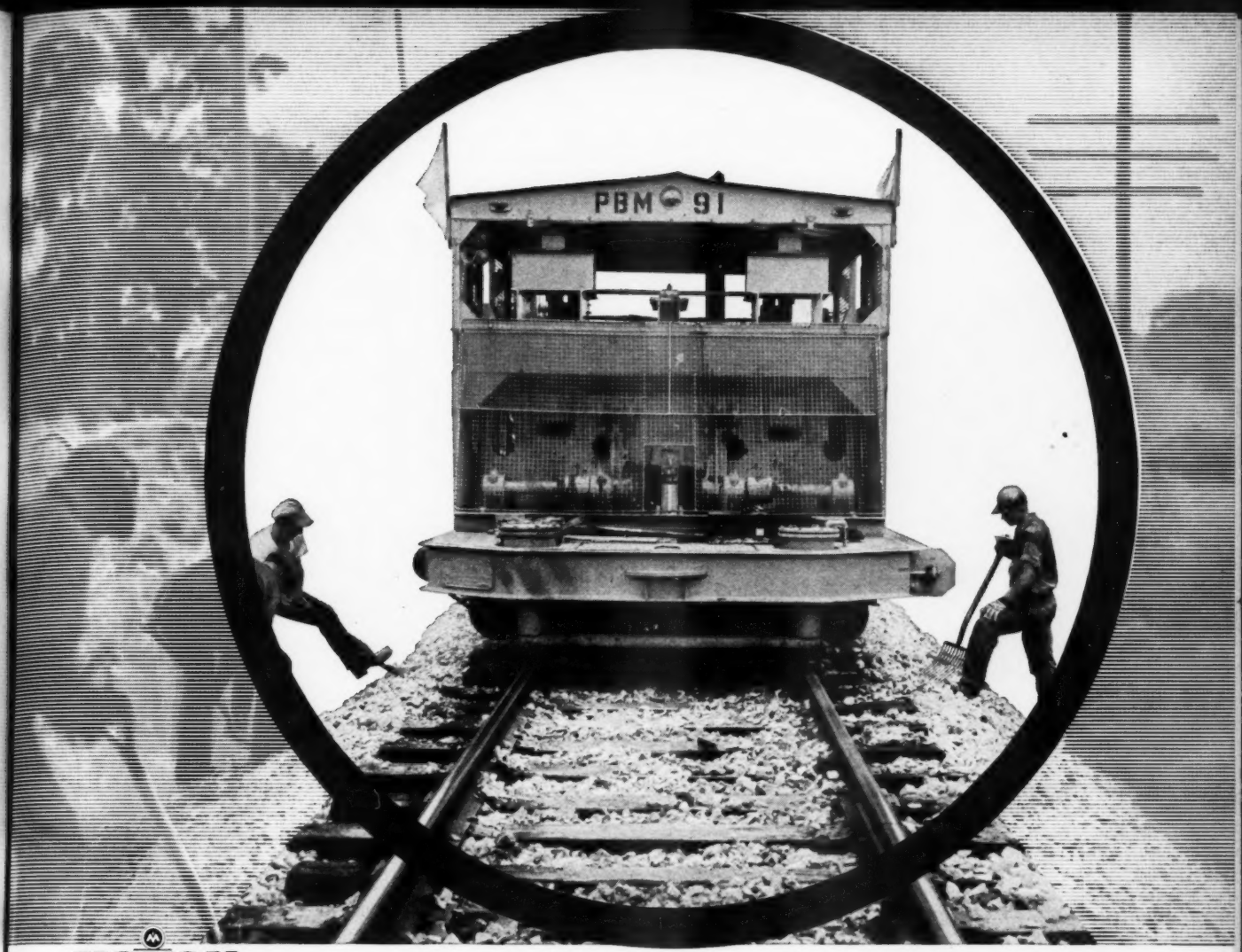
Address.....

City.....*Zone*....*State*.....

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + OX = RUST

THE ORIGINAL RUST PREVENTIVE



MONON
THE HOOSIER LINE

. . . another road that can show you why your best maintenance of way investment is a Power Ballaster.

Here's what YOU can expect from the POWER BALLASTER

Triple-Action Compaction—Tamps down, then under, then up—for an under tie ballast foundation that fully meets AREA standards.

Low Labor Requirement—Easily handled with as little as two 5-man gangs.

High Production at Low Cost—450 to 750 feet of tamped track per hour often pays for the Power Ballaster in one season.

Versatility—Tamps raises from 0" to 8" on rail of any weight, with any ballast.

Maximum Use of Track Time—Powered jacks permit 4 men to make lateral set-off in 3 to 5 minutes . . . 25 MPH speed for fast runs to siding, crib or work locations.

"Best of all was the service we got."

If you were to assume for the moment that the Power Ballaster can do a faster, lower-cost tamping job (*actual service records prove it*), you might well ask what you could expect in the way of factory *service*.

Let Mr. L. F. Racine, Chief Engineer of the Monon, tell you his reaction to the service that Pullman-Standard puts behind the Power Ballaster:

"Best of all was the good service we got from Pullman-Standard's people. We arranged for annual overhaul of our Power Ballaster at the Pullman plant. When our operator was called into the Army, Pullman quickly trained a new one for us at their factory."

The good performance of the Power Ballaster and the good service behind it—as so clearly demonstrated to the Monon—work together to serve you better. Let an experienced Power Ballaster Representative outline our sales and service programs . . . and show you the case-history *proof* of Power Ballaster performance. Write us today.

TRACK AT ITS LEVEL BEST . . . AT THE LOWEST COST

Pullman-Standard
CAR MANUFACTURING COMPANY

BIRMINGHAM • CLEVELAND • PITTSBURGH • NEW YORK • SAN FRANCISCO • WASHINGTON
CANADA: THE HOLDEN COMPANY, LTD., MONTREAL • TORONTO • WINNIPEG • VANCOUVER

Cost-Cutting Tools FOR BRIDGE BUILDING

Tough scaling jobs are handled quickly with the air-powered CP Triple Scaler — weighing only 7¼ pounds. No chisels are required, as the pistons act as chisels, hammering old paint, rust or scale without damaging the underlying surface.

Designed for drilling holes in masonry, concrete and stone up to 1¼ inches in diameter, the 7½-pound, air-powered CP-9 self-rotating Handril does the same work as non-rotating hammer drills of triple its weight. Readily operated with one hand, even for up-drilling. A specially designed chuck makes it easy to change steel. The same chuck handles non-rotating chisels.

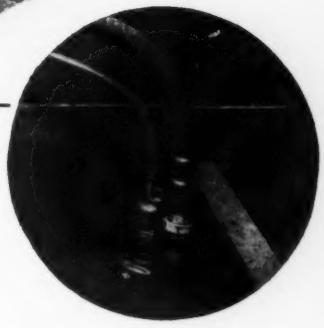
Loose scale is rapidly removed from any metal surface with air-powered CP Wire Brush Machines. Models, with either straight or pistol grip handles, are available with a wide choice of radial and cup wire brushes.

AND MAINTENANCE-OF-WAY

The CP-220 Hicycle Electric Concrete Vibrator can be operated anywhere in a 400-foot radius, without stopping to move the portable gasoline generator. Built for one-man operation. The vibrator motor is in the head of the tool; there is no flexible shafting.

Designed for concretes of 2" slump and over; walls, footings, columns, floor and roof slabs; precast piles and similar products. Capacity of 30 to 40 cubic yards an hour.

The powerful CP-365 Air Impact Wrench, with controllable rotary impact action, is unexcelled for fast, safe nut-running, and the application or removal of bolts, studs or lag screws. Absence of twisting or kickback, and little vibration, minimizes operator fatigue. Eight-inch extension shanks are available for screw spike driving.



The CP-20 Sump Pump operating at 40 pounds pressure against a 15-foot head, has a capacity of 200 gallons per minute. Operating at 80 pounds pressure against a 50-foot head, its capacity is 225 gallons per minute.

A single-stage centrifugal pump that requires no priming, it starts pumping instantly when air is turned on and the unit lowered into water.

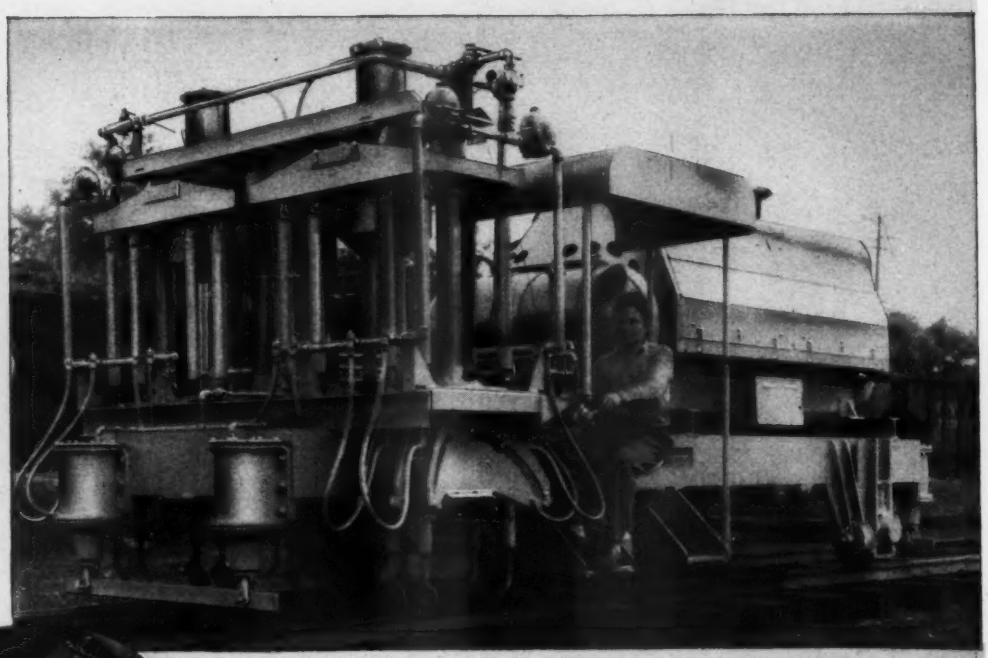
Perfectly balanced, requiring no riding, easy to hold, the CP-117 and CP-118 Cut Spike Drivers will drive any cut spike in a few seconds.

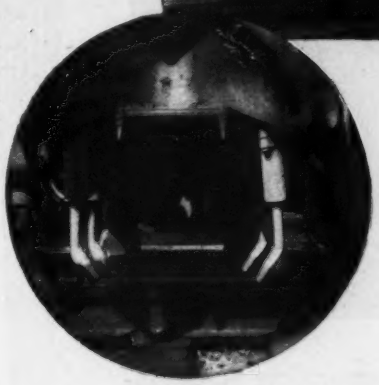
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

McWilliams
multiple tool
tie tamper





impact ***plus controlled pressure***

- ★ sixteen air tools controlled by one man
- ★ all the advantages of hand tamping plus uniformity and speed

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Railway Maintenance Corp.

P. O. BOX 1888 · PITTSBURGH 30, PA.

MONOTUBE

Monotube taper-flute steel piles can help you make important savings on all types of foundations. And today, more than ever, savings in materials and time are *doubly* important.

1. SAVES WORK!

because Monotube's light weight makes handling and locating easier, faster!

2. SAVES MATERIALS!

because of proven excellence in transmitting loads to the penetrated soil, plus the assurance of their condition after installation, Monotubes can be designed for heavy loads. Result—fewer piles may do your job.

3. SAVES TIME!

because Monotubes are readily extendible on the job, with easy cut-off and simplified weld splicing.

4. SAVES WORRIES!

because tubular design permits rapid, sure inspection before concreting.

Get all the facts about Monotubes' advantages. For complete information, write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Foundation Piles

Racor Switch Point Locks

Fig. 3911
SWITCH POINT LOCK
(Patented)

Provide added protection for New York Central's passenger train operation.

Essential to the safe operation of these trains, facing point switches must be secured in a closed position, regardless of failure or damage to the throwing mechanism. Racor Switch Point Locks can be installed with all designs of main line switch stands. Ruggedly designed — easily installed below top of ties as protection against damage, they function independently of stand.

Fig. 3911 (illustrated) for use with all types of column throw stands.
Fig. 3912 available for use with all types of ground throw stands.

America's most complete line of track specialties

AUTOMATIC SWITCH STANDS

VERTICAL SWITCH RODS

SAMSON SWITCH POINTS

SWITCH POINT LOCKS

RAIL LUBRICATORS

DEPTH HARDENED CROSSINGS

REVERSIBLE MANGANESE STEEL CROSSINGS

MANGANESE STEEL GUARD RAILS

Brake Shoe

RAMAPO AJAX DIVISION
109 North Wabash Avenue, Chicago 2, Ill.

RACOR

19 m.p.h. goes anywhere

Since its introduction over 4 years ago, Tournadozer has proven to be the best right-of-way maintenance dozer money can buy. You get a one-man work crew" that speeds dozing, pulling, pushing tasks anywhere. Tournadozer's unusual rubber-tired mobility lets you drive on highways or the right-of-way, handle work on, off, or across the tracks at will. You eliminate work train service, and main line delays, because operator simply gets on and drives job-to-job at a moment's notice. This speeds service, saves time.

Speeds to 19 m.p.h. forward, 8 m.p.h. reverse

Powerful 186 h.p. C Tournadozer gives you the high-speed operation you've always wanted in a railroad dozer . . . has 4 forward speeds to 19 m.p.h., 2 reverse to 8 m.p.h. — helps you get 2 to 3 times the production of crawlers. Gets more jobs done, faster.

No gear-shift delay

Tournamatic transmission eliminates stops for shifting . . puts constant power to work at all times without loss of momentum. When selector lever is moved speed wanted air-actuated clutches give instantaneous power transfer from one gear ratio to another. Torque converter, electric steer and shift are also available as optional equipment.

Eliminates tie-up of rail traffic, train equipment

Because Tournadozer gets out of the way fast, it does not tie up rail traffic while cleaning drainage ditches or landslides, cutting down banks, spreading cinders, ballast, preparing grade crossings, etc. It requires no work train, no train crew, no loading and unloading delays. Operator simply drives out to the job, cleans up the dirt to be moved, goes on to the next assignment. Your regular maintenance-of-way crew can become competent operators in a short time.

Ample traction . . . less maintenance

Big 21.00 x 25 low pressure tires assure ample flotation and traction for toughest going. There are no crawler track rollers to lubricate . . . no multitude of moving parts working in the open, exposed to dust, grit and water. With Tournadozer, moving parts are sealed in, lubricated, ride on antifriction bearings. You roll *over* abrasive materials instead of grinding through them.

Tires do not chamfer ties

Soft, flexible, wide-tread tires straddle rails, ride on ties without chamfering, thus saving tie maintenance. Rig also travels over single track trestles, through small diameter tunnels. In yards, it can cut directly across tracks, follow walkways, or travel on open track. Tournadozer is a real railroad tool . . . goes anywhere, works anywhere you have railroad dozing, pushing, or pulling to do.

Before you buy any dozer, it will pay you to get all the facts on this fast-moving, rubber-tired Tournadozer from your LeTourneau Distributor . . . see it in action and you'll be sold on its ability to help you.

cross-track TOURNADOZE
speeds right-of-way maintenan

More jobs at less cost

Versatile rubber-tired Tournadozer is "one-man work crew" . . . handles all types of railroad maintenance: spreads ballast, "daylights" curves, cleans ditches, backfills around culverts and bridge abutments, levels crossings, grades for sidings.

Quick repairs anywhere

Tournadozer is ready to go anytime via highway or down track at fast speeds to make short work of emergency jobs quickly removes slides, fills washouts, cleans up at wr straightens tracks, reinforces causeways and bridge approa

Faster material handling

With instant-shift selection of speeds to 19 m.p.h. forward and to 8 m.p.h. reverse, you stockpile sand, gravel, cinders, bulk chemicals, etc., faster and more economically. Big tires compact, seal coal without breakage. Oxygen is excluded by covering, packing.

Easy to operate

Air-actuated and electric controls take labor out of operating clutches to "fight", no end-of-day slow down. Operator sits c of engine . . . can see where he's going, what he's doing. Mu disc air brakes "stop on a dime," improving safety.

R. G. LeTourneau Inc.

LORAIN Thew TL Lorain HELPS THE NICKEL PLATE ROAD SELL

SMOOTH roadbeds get the traffic . . . and keep trains on highball schedules. Good drainage is important to roadbeds that are level, smooth and solid. That's why the Nickel Plate Road equipped their Maintenance-of-Way Department with a new Lorain TL25-J Dragline, shown below working on the main line. Here, it is digging a new drainage ditch 3½ miles long, 5 to 8 ft. deep and 8 ft. wide at the top and widening roadbed shoulders on the right-of-way.

TL FEATURES For Efficiency and Economy

- NEW DESIGN PRINCIPAL — Interchangeable "packaged" Components — clutch shaft, engine, hoist shaft, cab, crawler propelling mechanism — each may be removed and replaced as a unit.
- NO EXTRAS TO BUY — The "TL" is a complete package, includes all necessary and desirable accessories as standard equipment — 2 crawler travel speeds in both directions, power load-lowering, operating lights, electric starter and generator. Not a "stripped down" machine — "TL" is a complete package, ready to go to work.
- "BUILT-IN" LONG LIFE FEATURES — All gears are machine cut; all gears (except 2) are oil-enclosed; 18 anti-friction bearings are used on the clutch shaft alone; turntable hook rollers are mounted on drop-forged brackets . . . and there are many, many more in the "TL".

Maintenance-of-way work is but one of the many cost-cutting, labor-saving jobs for Lorains. Crawler or rubber-tire mountings are available to serve all types of railroad jobs — on-or-off-the-track, on-or-off-the-car. Five front end booms and more than 15 crane attachments enable Lorains to handle loads of any type, size or shape . . . and to serve every phase of railroading from construction to maintenance to stores.

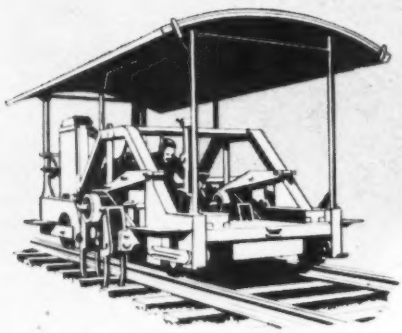
The modern Lorain-TL "Series" offers railroad men a multi-purpose shovel-crane for fast, safe, low-cost duty all along the line. Thew-Lorain Distributors are located in principal cities across the country to serve every need of the railroad industry!

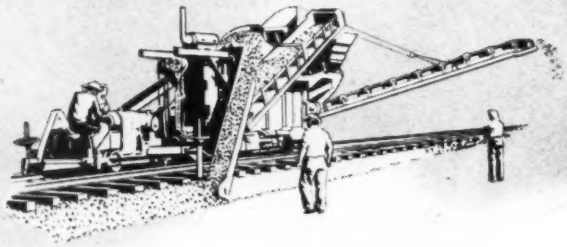
THE THEW SHOVEL CO.
LORAIN, OHIO

THEW LORAIN®

SHOVELS • CRANES • HOES
DRAGLINES • CLAMSHELLS
ON CRAWLERS OR RUBBER TIRES

Keep Ahead of Trackwork Schedules





with Matisa

TAMPER and CLEANER

AVAILABILITY

Long-run payoff on your trackwork equipment is how great a percentage of working availability you get from each machine. With Matisa equipment, you have two important factors that produce maximum equipment availability to keep ahead of trackwork schedules:

★ **STRUCTURAL DEPENDABILITY**

★ **IMMEDIATE ACTION ON PARTS AND SERVICES**

Matisa Automatic Tampers and Matisa Ballast Cleaners are without the "bugs" and "weak links" that frequently cause delays out of all proportion to their structural importance . . . And being structurally designed for continuous performance, both machines offer a degree of dependability we believe is unequalled in trackwork equipment now available.

Where long use or unusual conditions require parts or engineering service, Matisa maintains around-the-clock facilities which provide immediate action whenever and wherever necessary.

Ask our M. W. Engineering Department for details on the Matisa machines that are setting new standards for ballast cleaning efficiency and tamping precision throughout the world.

THE MATISA EQUIPMENT CORP.
224 South Michigan Blvd. • Chicago 4, Illinois

ALL OVER THE WORLD *Matisa* TRACKWORK SPECIALISTS

Clean Cut Job!

When an Oliver Crawler Tractor with a Heil Trail Builder does a job of cleaning a cut, it's clean-cut! Husky Oliver power combines with accurate control of moldboard action to assure really fine grading. Excessive, time-wasting reworking of the cut is eliminated...the job moves faster.

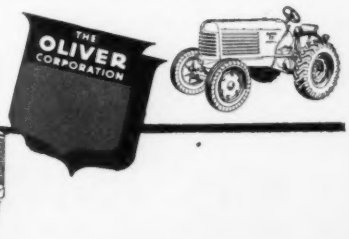
Oliver exclusive steering principle is an important advantage for right-of-way operation. You can travel a straight line regardless of the side drag of off-center loads on the blade. One track can be speeded up . . . the other slowed down to compensate for off-center loading. No time-wasting "jackknifing" is required.

Another important Oliver feature is easy accessibility. Maintenance is easy and economical. Rugged construction assures long, economical service . . . enables the tractor to stand up under the strains of railroad service.

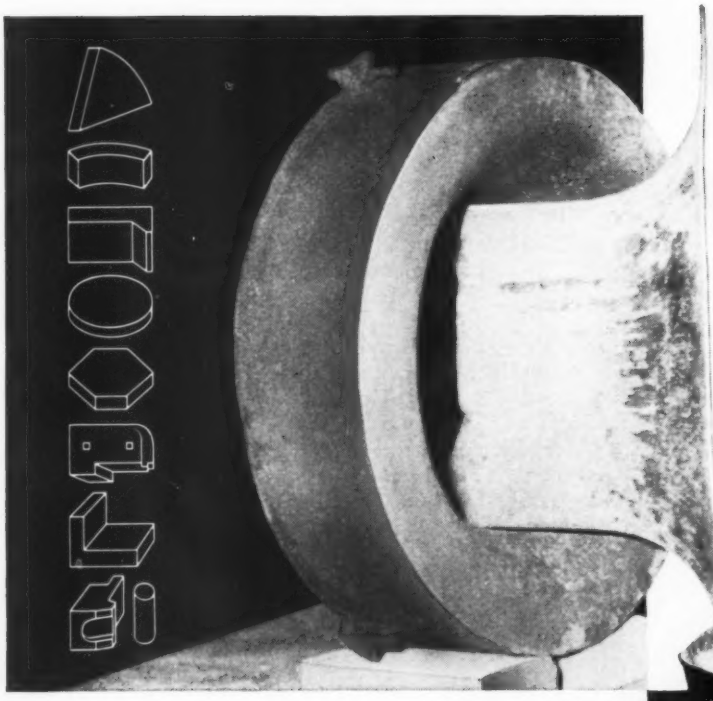
For complete information on Oliver Tractors and job-speeding allied equipment, see your Oliver Industrial Distributor or write The OLIVER Corporation, Industrial Division, 19300 Euclid Ave., Cleveland 17, O.

THE OLIVER CORPORATION

a complete line of industrial wheel and crawler tractors



NOW... Get refractory shapes like this faster, at lower cost...



Photograph at left shows a boiler ring cast with 3X Firecrete. It is just one of many shapes that can be cast and fired in less than 24 hours with this hydraulic setting Johns-Manville refractory material.

Just mix, then cast. 3X Firecrete mixes and pours like concrete . . . is easy to handle.

. . . cast them yourself with 3X FIRECRETE

WITHIN 24 hours you can have ready for use any refractory shape you need—and save money as well—by casting it yourself with monolithic, hydraulic setting Johns-Manville 3X Firecrete*.

You'll find that Firecrete mixes and pours as easily as concrete . . . and hardens quickly with negligible drying and firing shrinkage. It has high resistance to spalling, too. And it is designed to withstand soaking temperatures of 3000F . . . to meet the high operating temperatures encountered in railroad service today.

Furnished in 100-pound bags for convenient handling and storage, 3X Firecrete is *available for immediate delivery.* Why not write us today for further information on how it can solve *your* refractory problem? Address Johns-Manville, Box 290, New York 16, N. Y.

*REG. U. S. PAT. OFF.

JOHNS MANVILLE JM PRODUCTS **Johns-Manville**

93 YEARS OF SERVICE TO TRANSPORTATION

BROWNHOIST

builds better diesel electric locomotive-cranes . . .
only BROWNHOIST gives you all these features

NEW HOIST CLUTCHES. Roller-bearing mounted wide-faced drums. Air-operated cylinder, mounted within the drum itself . . . provides high line pull and easy adjustment.

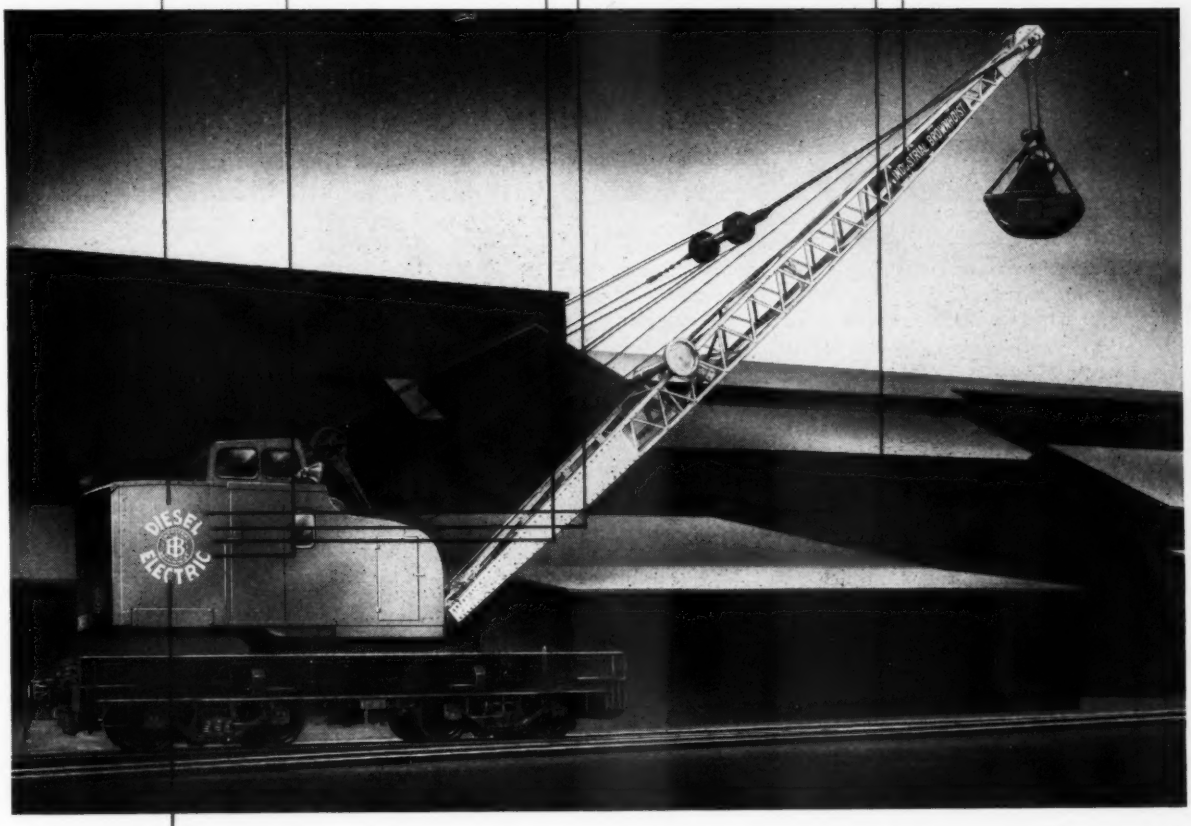
ELECTRIC ROTATION together with electric travel reduces maintenance to a minimum.

NEW FRICTION CLUTCH BOOM HOIST. Safe! Driven by worm and wheel enclosed in oil bath. Twin-barrelled, extra large diameter boom-hoist drums in full view of operator. Drums take all line in one layer which eliminates overlapping and fraying of rope.

DYNAMATIC CLUTCH between engine and crane machinery now standard equipment. Gives smooth, sensitive, 32 step control. Banishes slippage. Eliminates torsional impulse and vibration.

NEWLY DESIGNED, EXTRA HEAVY STREAMLINED CAB with controls functionally located for operating efficiency. All machinery guarded against weather, yet readily accessible.

NEW CLEAR-VISION BOOM provides maximum vision for greater working efficiency. This open type boom in conjunction with the Brownhoist patented Monitor-type cab guarantees 360° visibility.



BROWNHOIST

and these optional features—8 wheel chain drive for increased drawbar pull. Twin engine drive for work on extreme grades or where greater tractive effort is required. Timken roller bearing journals for low starting tractive effort. For complete description write to . . .

143

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • **DISTRICT OFFICES:** New York, Philadelphia, Pittsburgh, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montreal, Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles.

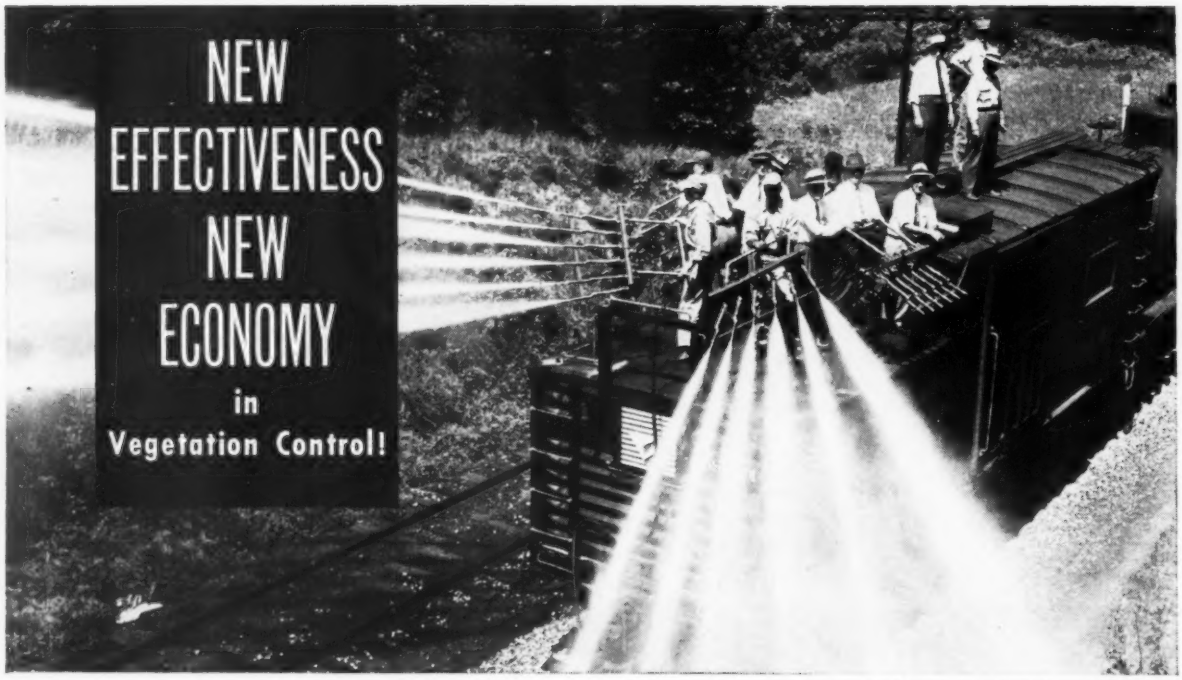


PHOTO COURTESY OF SPRAY SERVICES, INC.

ESTERON BRUSH KILLER

Men who count costs know that clearance and maintenance of right-of-ways overgrown with brush and weeds is an expensive, time-consuming job when this vegetation must be removed mechanically. Moreover, cutting gives only temporary relief—while chemical spraying can control regrowth and achieve eventual elimination of mile after mile of brush.

Dow, in cooperation with leading railroads and service organizations, has developed Esteron® Brush Killer to combat brush and weeds along right-of-ways. The use of Esteron Brush Killer can simplify *your* maintenance and save *you* 50% or more over hand-cutting methods.

A wealth of information is yours on request.

ESTERON BRUSH KILLER is a mixture of low volatility polypropylene glycol butyl ether esters of 2,4-D and 2,4,5-T. It assures satisfactory control of most woody species. Highly recommended for foliage and stem application during the growing season.

ESTERON 245 contains low volatility polypropylene glycol butyl ether esters of 2,4,5-T. Particularly effective on 2,4-D-resistant woody species. Very effective for year-round stump treatment and basal bark applications.

SODIUM TCA 90% controls such grasses as Johnson, quack and Bermuda. Mixes readily with 2,4-D for control in a single application of weeds and grasses in the ballast section.

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Agricultural Chemical Department
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USE DEPENDABLE DOW AGRICULTURAL CHEMICAL PRODUCTS
WEED, BRUSH AND GRASS KILLERS • INSECTICIDES
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GRAIN AND SOIL FUMIGANTS • WOOD PRESERVATIVE

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CHEMICALS
INDISPENSABLE TO INDUSTRY
AND AGRICULTURE

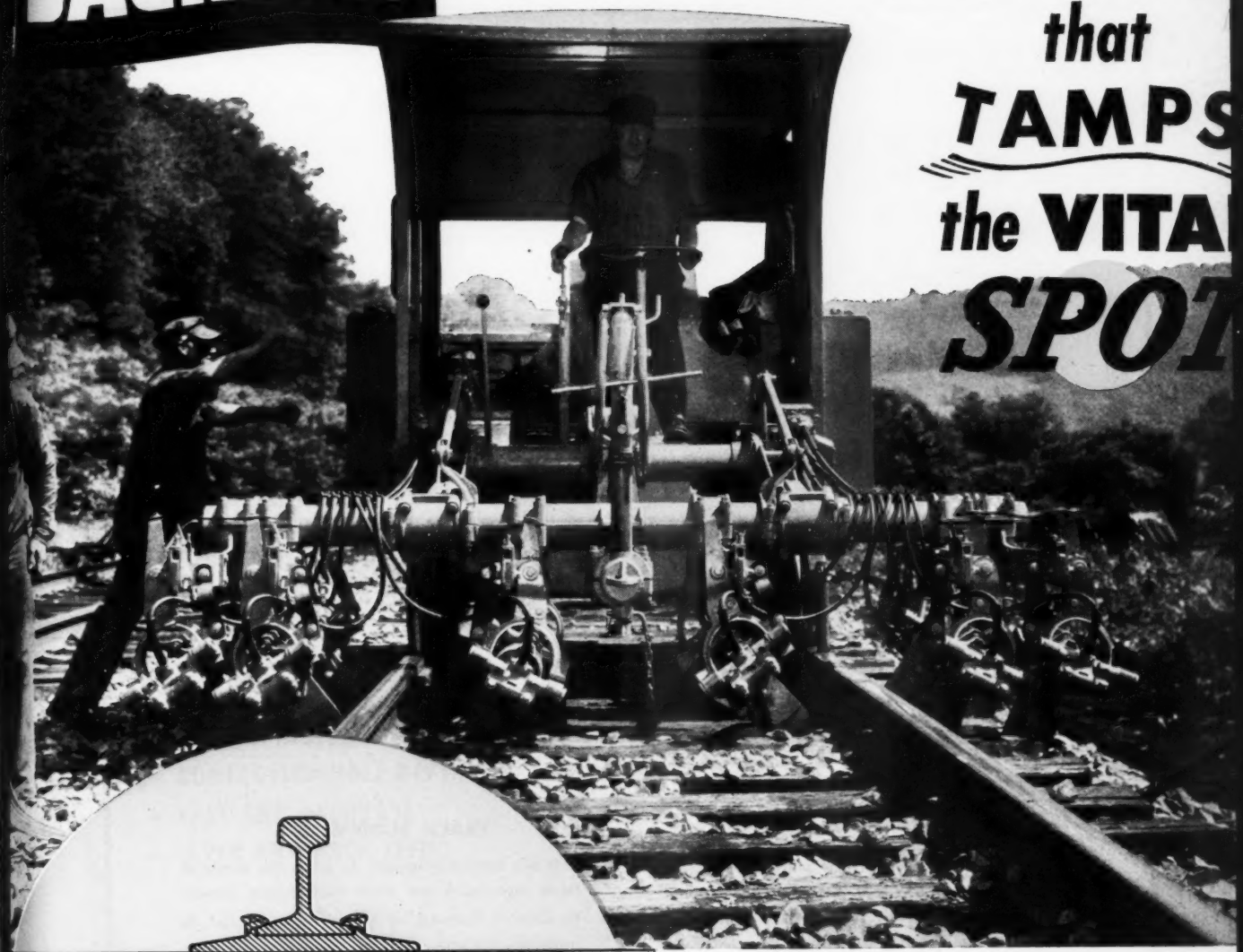
For additional information, use postcard, pages 1095-1096

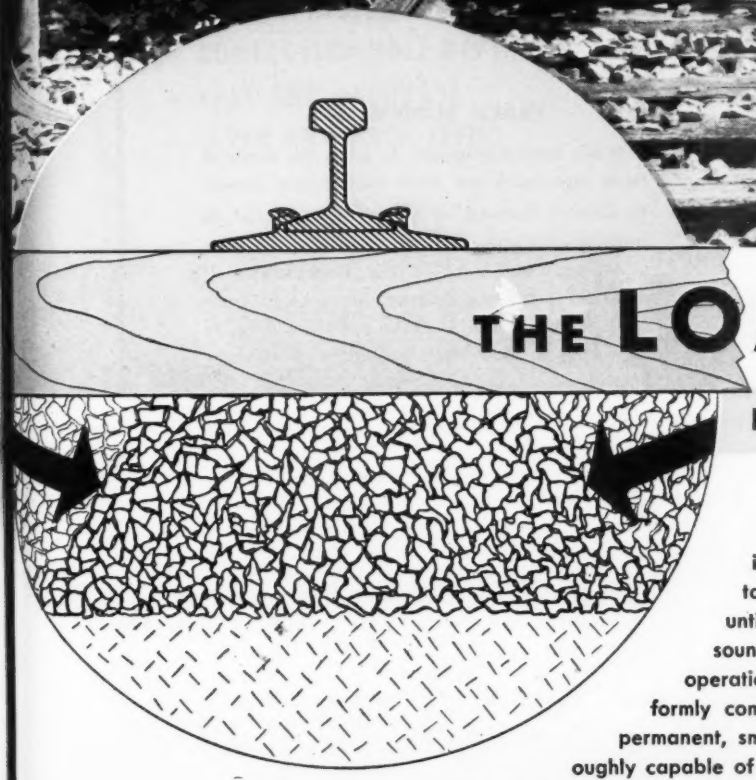
JACKSON *The* ONLY MULTIPLE TAMPE

that TAMPS

the VITA

SPOT





THE LOAD-*BE*ARING ZON

DIRECTLY BENEATH THE RA

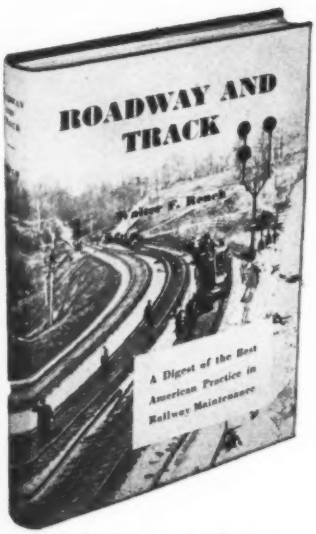
In the actual photo and the diagrammatical sketch above, how the blades of the Jackson Multiple Tamper are directed u the ties, **right beneath the rails where the greatest loa imposed.** Here, in the VITAL ZONE, the powerful thrust and v tory action of the Multiple's tamping blades force the ballast ar until the pieces are tightly fitted together into a closely integr soundly compacted and lastingly-firm bed. And it all can be done in operation with no follow-up of any kind required. Only the JACKSON formly compacts maximum ballast in this critical area to produce the permanent, smooth-riding track, with tie-beds having load bearing qualities oughly capable of sustaining today's heavy, fast, high-frequency traffic—a vital f in reducing the cost of maintaining track and rolling-stock. Savings in time and effected with these machines usually more than pay for them in a single season. Let us furni with complete information, NOW, so you can consider them for your 1952 appropriations.

ELECTRIC TAMPER & EQUIPMENT CO. LUDIN MICH

A Handbook of
Modern Track Work

ROADWAY AND TRACK

By Walter F. Rench
Formerly Supervisor on the Pennsylvania Railroad;
Author of Simplified Curve and Switch Work



Third Ed. 350 pages, 101 photographs 19 line drawings, 12 tables, index, 6 x 9, cloth, $5.00.

The third edition features the use of the latest mechanical equipment in connection with roadway and track maintenance. Older methods employed where full mechanical equipment is not available are also explained. While most of the methods described are those which are standard on the **Pennsylvania**, A.R.E.A. recommended practices and those in use on other well maintained roads have also been included.

Outstanding types of mechanical equipment used in track work are described and illustrated with action photographs. Engineering drawings show working details. The economies resulting from the adoption of modern methods are clearly outlined. Useful tables have been added to make the book suitable for reference use, as well as a practical handbook on modern methods.

CONTENTS

Part I–ROADWAY: Essential Elements in Roadway Maintenance–The Right of Way–Drainage of Roadbed and Track–Vegetation for Banks–Economics of Roadway Machines–Labor Saving Methods and Devices in Roadway Work–Small Tools and Their Uses.

Part II–TRACK: Essential Elements in Maintenance of Track–Program for Maintenance of Way and Structures Work–The Track Obstruction–Power Machines and Equipment–Labor Saving Methods in Track Work–Track Materials and Their Uses–Practice in Rail Renewals–Practice in Rail Repair and Inspection–Maintenance of Main Tracks–Maintenance of Yards and Terminals.

Part III–SPECIAL PROBLEMS AND DUTIES: Maintenance Problems and Methods Used–Economics of Track Labor–Special Duties in the Maintenance of Way Department.

SUPPLEMENT: A 10-page Supplement describing new A.R.E.A. recommendations and changes up to July 1, 1948, can be cut for insertion in proper place.

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Send for your copy today and see how it will help you improve your knowledge of your work.

TRACK SUPERVISORS

While written primarily to serve the needs of track supervisors and other maintenance officers, it contains material of considerable interest to transportation and mechanical officers who require a working knowledge of the fundamentals of maintenance of way practice. Section and extra-gang foremen, who wish to acquire a broader knowledge of their work will find it particularly helpful.

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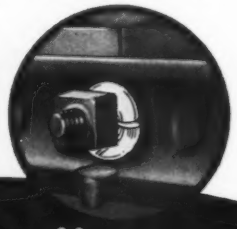
These washers are strong and tough, yet provide the necessary "springing action" required at rail joints, frogs and crossings.

We control every step of their manufacture—from the specification of the specially-developed formula and process used in making the steel to the forming, hardening, tempering and testing operations. Made to the exact dimensions specified by the American Standards' Association.



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Clear tracks ahead for the Milwaukee Road as an HT4 TRAXCAVATOR loads out traffic-blocking snow in the Minneapolis yards.

KEEP WORK "ON SCHEDULE" THE YEAR AROUND

Cleaning the debris of a dismantled powerhouse, this T4 TRAXCAVATOR handles rough chunks of concrete and iron to make way for new sidings.

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TRAXCAVATORS keep your work program rolling on a time-table schedule and no interference with your on-track rolling stock.

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Plan your next year's work schedules now—with TRAXCAVATORS. Your TRACKSON-CATERPILLAR Dealer can help you pick the right size for your work (there are five models with capacities from ½ to 4 cubic yards) . . . or write TRACKSON COMPANY, Dept. RE-121, Milwaukee 1, Wisconsin.

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Control WEEDS and ICE easily, *inexpensively* with a WOOLERY!

A great many millions of dollars have been spent keeping roadbeds clear of weeds—and also for keeping retarders and switches open in the winter.

The Woolery PB-B—a versatile, flexible yard or on-the-line weed burner does these jobs *without fuss—and has been doing them for years!* A good example of what we mean: it destroys all weeds *completely* (due to individually controlled burner arms for raising and lowering as required by ground contour) in a 15-foot swath on one trip and—with burner arms extended on return trip—burns a 25-foot swath! *Yet the PB-B can be taken off track by only two men!*

Small, light, *inexpensive*—towed by a motor car, the PB-B is the ideal burner for yard work—and in many cases *better* than larger burners for on-the-line work. Can be put on the job *faster!* (Three other Woolery burners in larger sizes available.)

Send for folder #170

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Woolery MACHINE COMPANY

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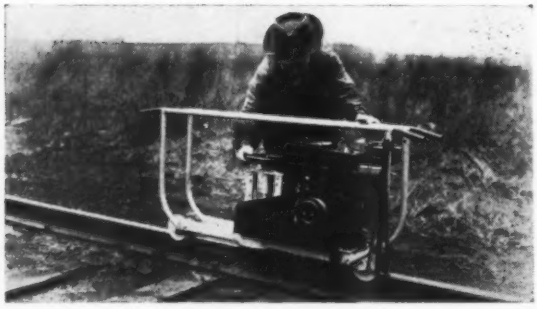
Exclusive Export Representatives

PRESSED STEEL CAR CO., NEW YORK, N. Y.

Increases
RAIL GRINDING ACCURACY



NEW P-45
PORTABLE RAIL SURFACE GRINDER

This new, one-man cup wheel machine grinds welded rail ends and removes mill tolerance and scale before heat treating. With a high degree of accuracy at a minimum of operator's skill and effort . . . gives a smooth, highly polished surface. Portability and light weight make it ideal for heavy traffic lines.

Check these advantages!

- √ 3½ H.P. air-cooled gasoline engine.
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- √ Cup Wheel is adjustable to compensate for wear.
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- √ Rollers on carriage guide are adjustable—assure proper cutting angle of grinding wheel.
- √ Length, 58 inches — Width, 14½ inches — Height, 25½ inches — weight, 225 lbs.
- • *Write* for more information on the P-45 and other fast, easy-to-operate track equipment.

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Distributors for

Burro Cranes	McCulloch Chain Saws
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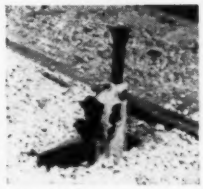
SET FIRMLY — STAND STRAIGHT

FOR THE *"BIG LIFT"* IN

Track Jacking



For track maintenance, including surfacing, lining, tamping-ballasting, tie plate renewal, and in conjunction with welded rail, you'll find—among other features—that Simplex Aluminum Alloy Track Jacks set more firmly and stand straighter. The large 2½" x 3¼" forged (not a welded plate), machined toe gives the "big lift" easily under rail or under ties without damage. Sturdy, lightweight, Aluminum Alloy housings are reinforced at all stress points. Greater bearing area of rack bar on housing gibs reduces wear. Simplex Jacks lift full capacity on toe or cap.

SIMPLEX 16A
Full 6" lift—highest of any surfacing jack. Minimum toe height 1½". Eliminates ballast removal; less digging in under-tie work. Trips from right or left. Improved safety thumb guard. Capacity 15 tons; weighs 45 lbs.

SIMPLEX A5
Capacity 15 tons; weighs only 28 lbs. 5" lift.

SIMPLEX A17
Capacity 15 tons; weighs only 41½ lbs. 13" lift.

Simplex LEVER • SCREW • HYDRAULIC **Jacks**

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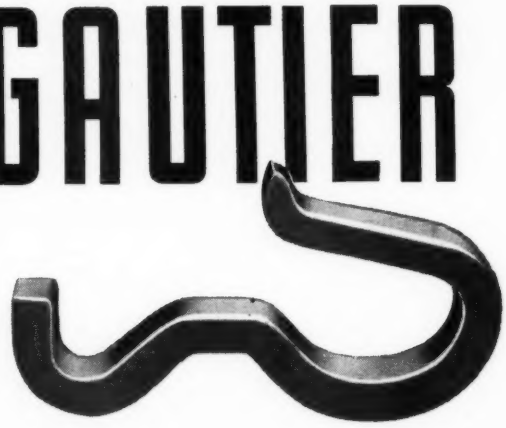
The IMPROVED
GAUTIER



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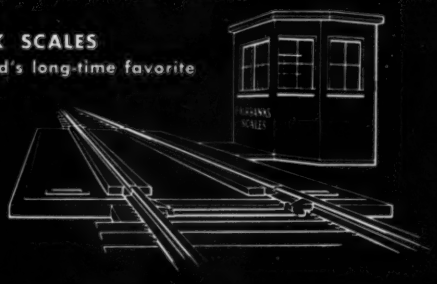
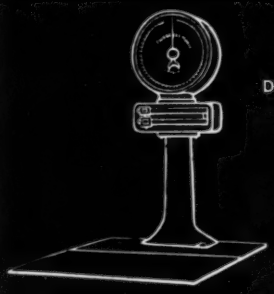
The railroad world's long-time favorite

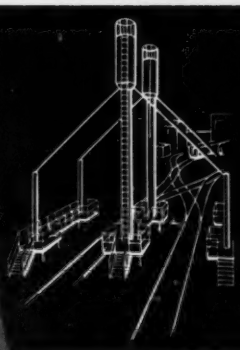


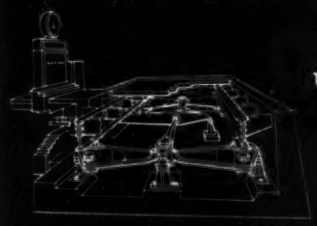
TURBINE PUMPS
Oil or water lubricated models



WAREHOUSE SCALES
Dial scales for warehouse weighing

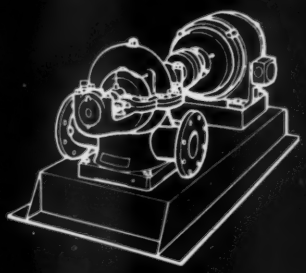
SAND STATIONS
with new, fast-action, easy-to-use sand nozzles.





TRUCK SCALES
True weight measurement for years of off-track operation

CENTRIFUGAL PUMPS
Also positive displacement types for fueling stations



FOR COST-REDUCING RAILROAD EQUIPMENT...

FAIRBANKS-MORSE,

a name worth remembering

DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS • SCALES
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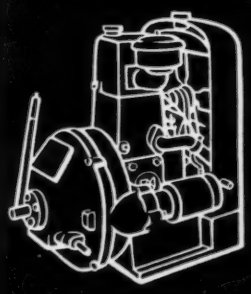

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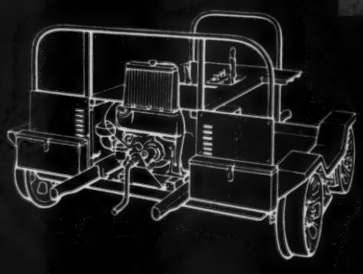
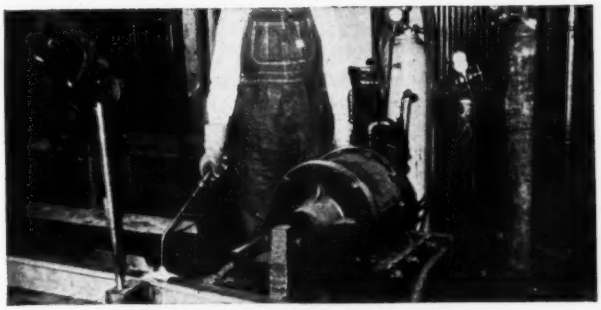
Complete gang and inspection equipment, including the new model 101 with immediate reverse and other safety features.

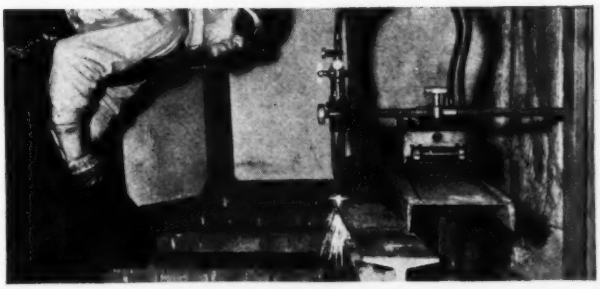


WHAT'S THE BEST WAY

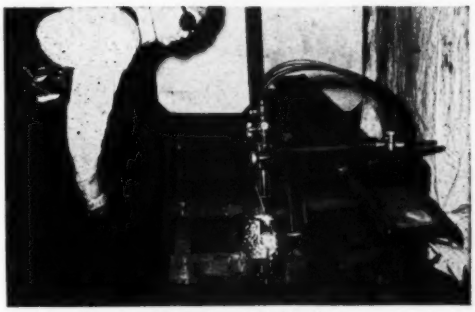
...to fabricate rigid frogs?



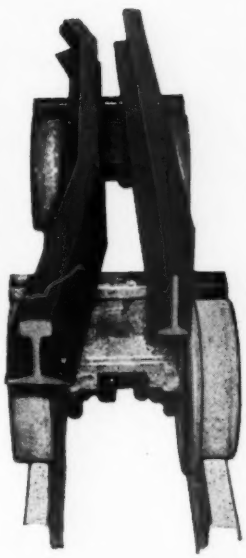
Heating Wing Rail for Bending Operation



Cutting Wing Rail After Bending



Cutting Long Point Rail



Both Rails After Bending, Cutting and Finishing

Use the Oxyacetylene flame processes!

Airco Railroad Service Representatives recently supervised the fabrication of rigid frogs in a large railroad shop. They observed costs and results. On the basis of this experience, they recommend:

For Bending – heat both the wing rail and the long point rail in required places with the oxyacetylene flame. This simplifies the actual bending operation – cuts time and cost.

For Cutting – make the two cuts on ball and the two on the base of long point rail with the Airco No. 10 Radiagraph (portable, oxyacetylene gas cutting machine) and using the same machine make the necessary cut on the wing rail.

This type of cutting operation was found to be far more economical and less time consuming than doing the same job by other means.

For more information about the above job and other oxyacetylene flame or arc welding applications, write your nearest Airco office.

Costs Come Down Under the Airco Plan

AIRCO

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
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Gets 77% more pulling power with help of TIMKEN® bearings

WHEN loads are too heavy for a standard section car, yet too light to warrant using a heavy gang car, a Fairmont ST2 Series H heavy duty section car meets the need for additional power. A two speed gear installed on the drive axle provides 77% more pulling power in low.

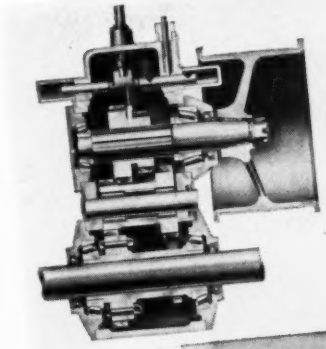
To insure proper shaft alignment and accurate meshing in the gear box, Fairmont Railway Motors, Inc. uses Timken® tapered roller bearings on the two speed gear and final drive. Timken bearings also are used on the axles to keep wheels turning smoothly.

Timken bearings hold shafts in rigid, positive alignment. Excessive wear on moving parts is eliminated. Because of their tapered construction, Timken bearings can take any combination of radial and thrust loads. Line contact between rollers and races gives extra load-carrying capacity. True rolling motion and an incredibly smooth surface finish assure virtually friction-free operation.

Because they keep housing and shaft concentric, Timken bearings make closures more effective. Lubricant stays in—dirt stays out. Costly delays for maintenance and lubrication are cut to a minimum. Made of Timken fine alloy steel, Timken bearings are case-hardened to provide a hard, wear resistant surface and a tough, shock resistant core.

Over 50 years of bearing research and development have gone into Timken tapered roller bearings. Throughout all industry they are first choice. To get all the advantages that only Timken bearings can give, insist on bearings with the trade-mark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **FAIRMONT RAILWAY MOTORS, INC.** assures proper shaft alignment and accurate gear meshing in its heavy duty section car.

FINISHED TO CLOSER TOLERANCES

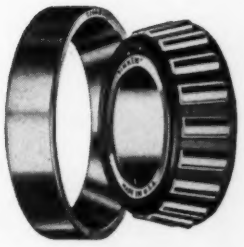
Finishing to incredible smoothness accounts for much of the precise, smooth rolling performance of Timken bearings. This honing operation is typical of the amazingly accurate manufacturing methods of the Timken Company.

The Timken Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

TIMKEN

TRADE-MARK REG. U.S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ▯ AND THRUST →▯← LOADS OR ANY COMBINATION

THE NORDBERG *POWER JACK*

The NORDBERG *POWER JACK* will handle any kind of track, and work in any kind of ballast.

"Mechanical Muscles"

for all Raising-Reballasting Jobs

SPEED, accuracy, and ease of handling on or off the track are basic advantages of the Nordberg Power Jack for reballasting, general surfacing and all other operations where raising of track is involved. Lifting is accomplished by means of hydraulic rams actuated by oil under pressure. Alignment is maintained even when making heavy and high lifts. One Nordberg Power Jack easily keeps ahead of any tamping gang.

It will pay you to take advantage of the "mechanical muscles" of the Nordberg Power Jack to reduce maintenance costs.

For details, send for BULLETIN 138.

The NORDBERG *POWER JACK* will pay for itself in raising only 13.8 MILES OF TRACK

R450-R

Look to **NORDBERG** . . . *for continually improved* TRACK MAINTENANCE MACHINERY *to do a Better, Faster Maintenance Job at Lower Cost*

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

Products Index

In Your 1952 Weed Control Program

For Real Results instead of Half-Way Measures

Investigate

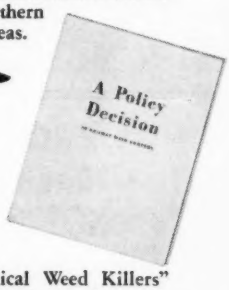
It's tailor-made for all types of vegetation—for all climatic conditions!

GENERAL CHEMICAL

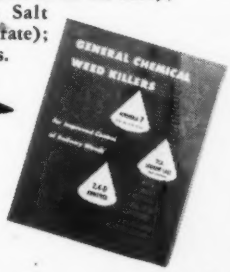
WEED CONTROL

TRADE MARK REG U S PAT. OFF

Important information available: "A Policy Decision in Railroad Weed Control" . . . outlining General's proven method of treatment. It contains full color illustrations of results achieved in northern and southern areas.



"General Chemical Weed Killers" ...helpful information on General's Weed Killers. These include: Formula 7 (TCA, acid in an oil base); TCA, Sodium Salt (liquid concentrate); 2, 4-D Additives.



Let us tell you how the proven General Chemical Weed Control Program has achieved outstanding results for leading roads.

At your convenience, a conference with a General Chemical Weed Control Specialist may be arranged to discuss your particular problem and its solution. Before we call, let us send you copies of our latest literature. ***Write on business letterhead to***

WEED KILLER DEPARTMENT

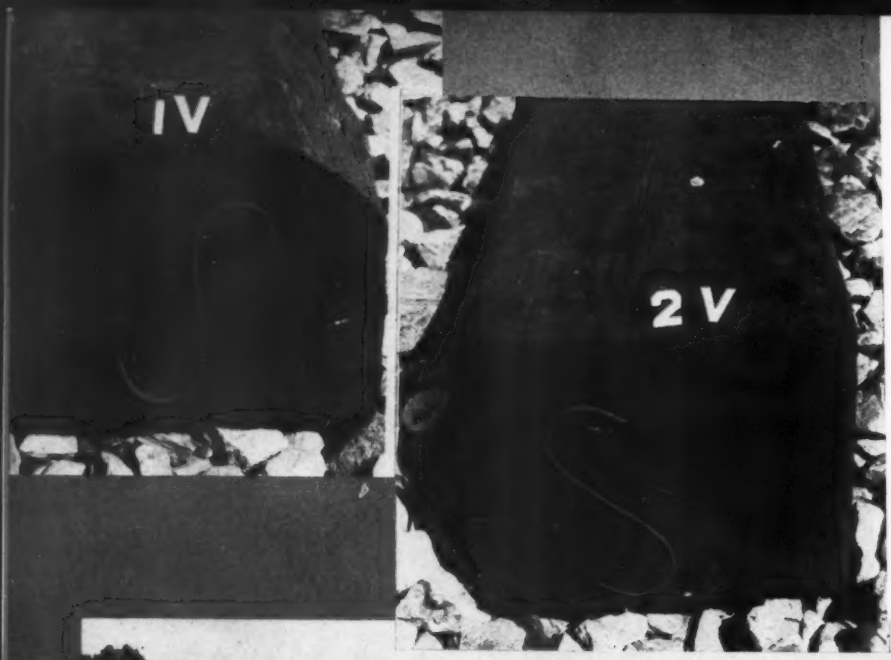
GENERAL CHEMICAL DIVISION

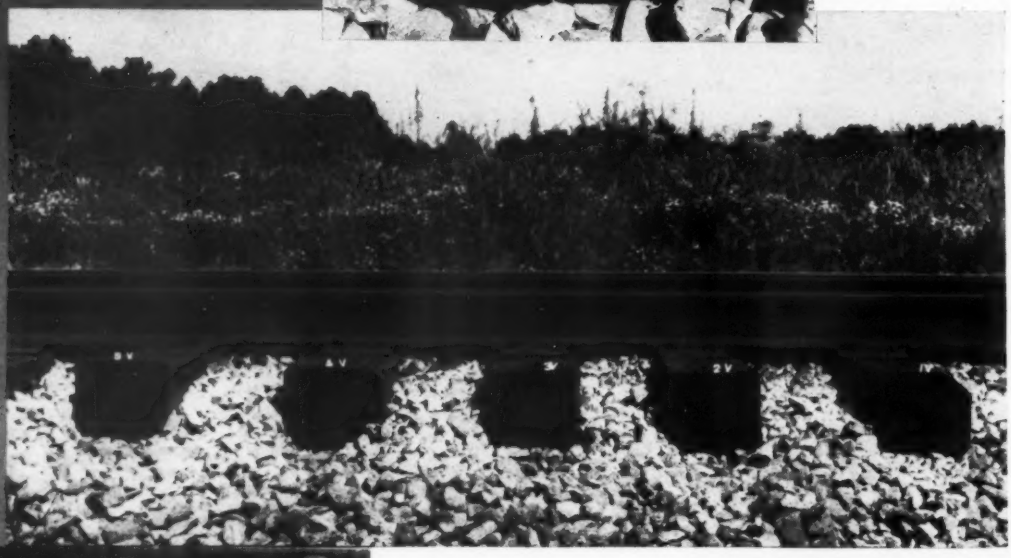
ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

NOW EIGHT

The illustrations on this page are unretouched photographs of Vapor-Dried* Red Oak ties, eight years after installation on the Asheville Division of the Southern Railway.





VAPOR-DRIED* Vs YOU be

Railroad engineering officials expect Vapor-Dried* crossties will last *at least* two years longer in track than air seasoned crossties and will also cost less in the long run. In addition to longer life, other economic advantages of Vapor-Dried crossties include:

1. Deeper penetration and better distribution of preservative.
2. Greatly reduced green tie inventory.
3. Substantial savings in interest and insurance.
4. Considerable saving in less handling.

TAYLOR-COLQUITT CO. T-C TIMBER CONSERVATION ®

*Process Patented

TAYLOR-

"FROM TREES TO TRACK IN *HOURS*, NOT MONTHS."

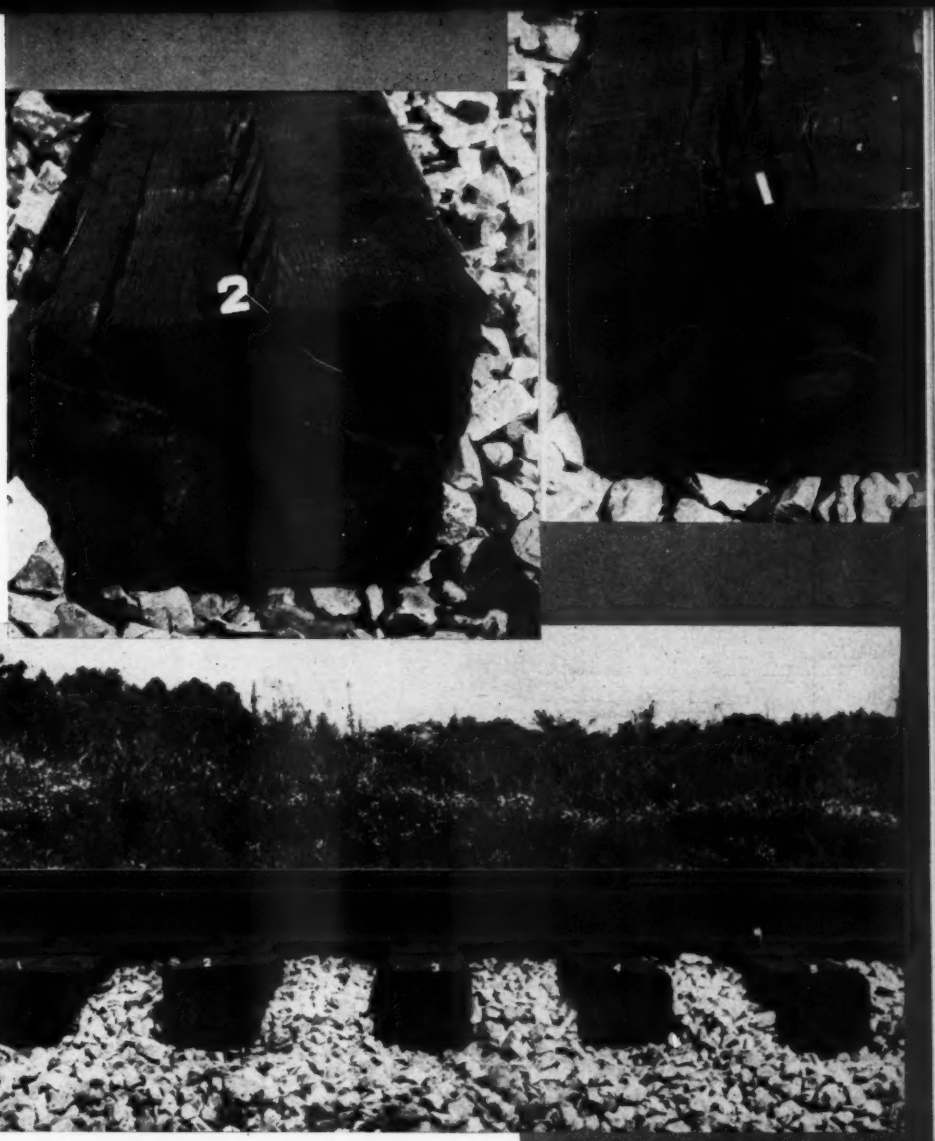
YEARS OLD

The illustrations on this page are unretouched photographs of air seasoned Red Oak ties, eight years after installation on the Asheville Division of the Southern Railway.

AIR SEASONED

the judge!

Checks and splits mark the doom of many a tie which might otherwise be good for years to come. Checks and splits let in moisture and decay, as well as ballast particles which under the influence of shrinking and swelling, finally cause the tie to split apart. The result — replacement before the tie's normal life is realized. Nearly 50% of creosoted oak tie failures are due to checking and splitting. This was the finding by impartial experts on an inspection of ties removed from two Southeastern Railroads.



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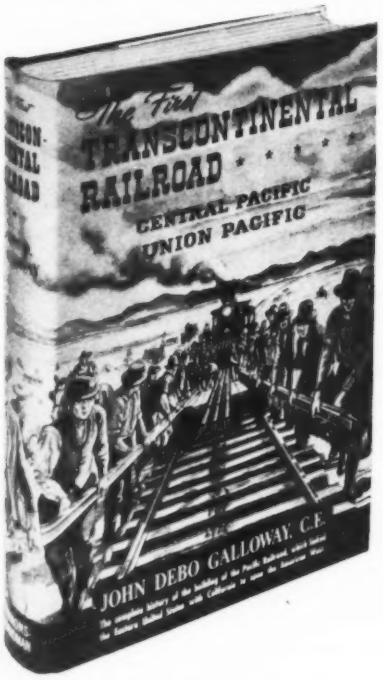

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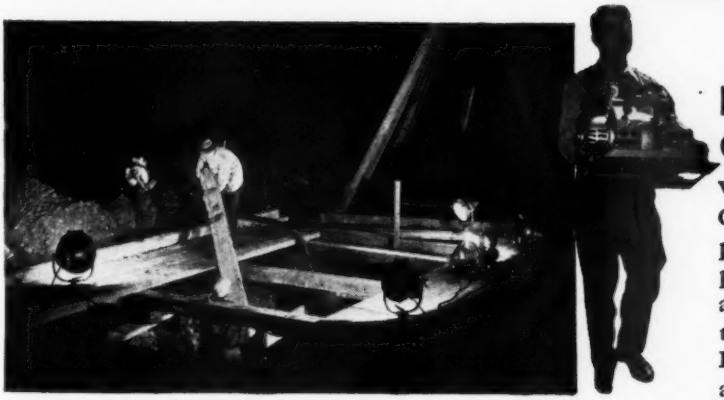

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No. 276 of a series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION 79 W. MONROE STREET CHICAGO 3, ILL.

Subject: Magazine-Reader Relationships

December 1, 1951

Dear Readers:

One of the objectives of any trade magazine such as Maintenance is to achieve the closest possible relationship with its readers. The kind of relationship that I consider mutually most advantageous derives, I think, from certain characteristics on the part of the magazine, which result in reactions on the part of the reader that draw him closer to the publication. A full discussion of all the factors involved would require much more space than is available on this page, but at least they can be mentioned.

In the first place, I am sure, a magazine should have a long record of service to a group of readers all of whom have close common interests with each other. This long background of service is necessary if the readers are to acquire confidence in the ability of the publication to serve their particular needs. Only then do they begin to look upon the magazine as their publication, to be counted on year after year to bring them authentic information on developments that have a direct bearing on the problems they encounter in their daily work. When the readers have acquired this attitude toward the magazine I think it can be said that the optimum relationship has been established.

I call your attention to the statement in the previous paragraph that, if the best relationship is to be achieved, all the readers should have "close common interests with each other." Why is this necessary? I'm not sure but what the answer to this question has to be felt rather than explained in so many words. The closest I can come to an adequate explanation is to say that any group of people having close common interests will naturally have an affinity of feeling for a magazine that is devoted to the interests of that group alone. In their minds the magazine becomes part of the group. It is said that sentiment has no place in business, but I'm sure there is at least some sentiment in the attitude of readers toward trade magazines that have served them well for many years.

Having been established for many years, and having won the confidence of its readers, a magazine cannot rest on its laurels and expect to maintain its standing in their eyes. This requires unrelenting effort in every sphere of activity that is involved in getting out a successful publication. But it is at once reassuring and inspiring for an editorial staff to realize that its efforts are backed by a tradition of service of many years' standing.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

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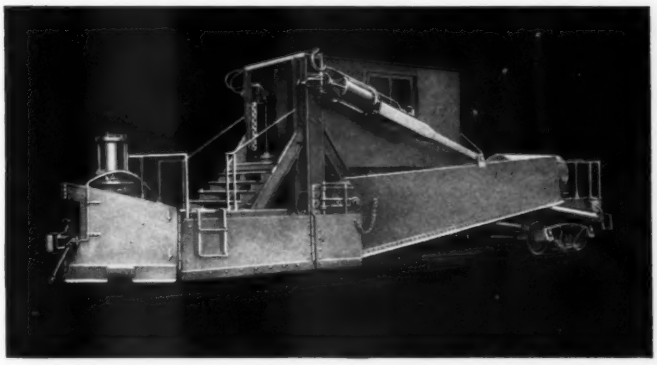
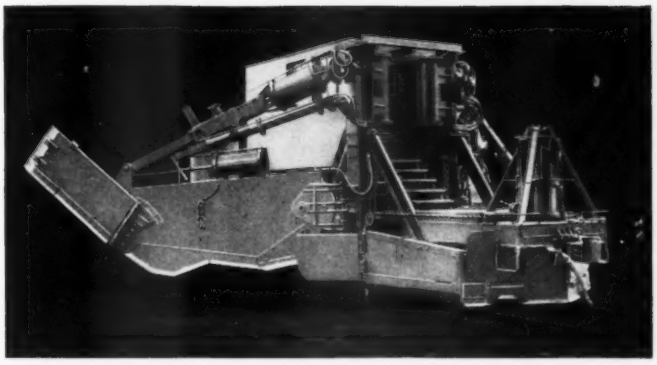
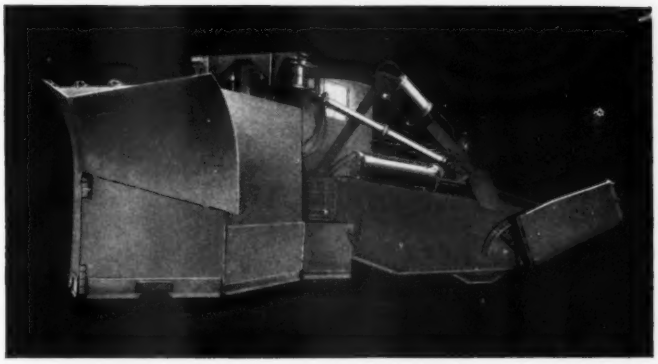


SPREADERS—



DITCHERS—



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Programming—

Of M/W Work Getting More Attractive

As time goes by it appears that the policy of programming railway maintenance operations in advance for the entire year is becoming increasingly attractive. As used here the word "programming" means the careful and precise scheduling of at least all heavy maintenance operations, based on the total money allotment for this work, which is determined as soon as possible after January 1. The schedules will include the amount and location of the work to be done, the dates on which each job will be started and completed, the size and organization of the labor force to be used, and the number and types of machines required.

This type of programming is one way of helping to get the maximum production per man-hour that is so essential in these days of high labor costs. Furthermore, these high costs have dictated the extensive use of machines, which also must be employed to the best advantage. Because of the five-day week there are fewer hours in the week during which these machines can be made to pay a return. Hence, it becomes more necessary than ever to schedule maintenance operations accurately so that equipment can be moved from job to job with a minimum of idle time.

On one road that is scheduling its maintenance work with an unusual degree of refinement it is reported that the practice has been like a "shot in the arm" in its effect on the morale of employees, and that this effect has extended far down in the ranks. Knowing that they are working on a schedule, the supervisory personnel, and even many of the workers, will not only voluntarily extend themselves as necessary to keep on schedule, but will take pride in doing so. The result obviously is more production per-man-hour.

There will doubtless be little disagreement with the statements made here regarding the advantages of precise scheduling of m/w work. But there will be protestations to the effect that any attempt to schedule such work in the manner suggested will encounter serious difficulties. To take the position that such problems would not arise would be unrealistic. For instance, the problem of correlating the delivery of materials, especially rails and fastenings, with the work schedules would be very real indeed, especially in these days when deliveries from the mills are so uncertain. Furthermore, and more basic, the initial hurdle of getting management to commit itself to a policy of alloting a definite sum for an entire year's maintenance program would be extremely difficult to surmount on many railroads. And adoption of such a policy would have to include the understanding that, once a year's program had been established, nothing less than major developments should be allowed to interfere with it; frequent changes or cut-backs in the program after the working season has started would be certain to have a serious effect on morale and efficiency, thereby at least partly nullifying the advantages of programming.

To mention that these obstacles exist is not to say that they are insurmountable. The best proof available that a system of precise programming can be made to work is the fact that it is being used successfully on a number of roads. Apparently, the first requisite to success is for top maintenance officers to "sell" themselves thoroughly on the advantages of this kind of programming. Not until then will they have a reasonable chance of getting their managements to accept the idea.

CONCRETE FLOORS—

Proper Paint Selection Is Important

CONCRETE floors are being used extensively in railway buildings. In the more-important buildings such floors are normally surfaced with terrazzo, ceramic tiles, linoleum, or flooring tiles of cork, rubber and asphalt compounds, while, in the less-important buildings, where the use of floor coverings may not be justified, the concrete floors are left uncovered. However, bare concrete has the disadvantage of being cold and uninviting in appearance, which is especially objectionable in buildings that are used extensively by the public.

To offset this effect, many building men are making concrete floors "warm" by painting them in attractive colors and patterns. But in many cases their paint has peeled off or worn out quickly in traffic lanes, thus creating an unsightly appearance. Such experiences are in most cases the direct result of using a paint that is incompatible with concrete.

A floor specialist points out that concrete is naturally alkaline and that, when wet or even damp, the alkali reacts against almost any vegetable or animal matter. Hence, ordinary paints are seldom, if ever, recommended for concrete floors, and the floor enamels, made by an entirely different process and from different materials, are used instead. But many floor enamels are made from either live or fosilized resins and vegetable drying oils—a combination that is reported to be practically 100 per cent susceptible to alkaline reaction. Hence, these enamels should not be used for painting concrete; if they are, the paint film decomposes and disintegrates.

A second type of floor enamel is made of phenolic resins, vegetable drying oils and color pigments. The phenolics, which are of synthetic origin, differ from the natural resins and are immune to alkali. While this second type of enamel is more resistant to alkaline reaction, it contains the same kind of vegetable oils as the first type mentioned, and therefore is still vulnerable to decomposition and disintegration when used on concrete.

A third type of floor enamel, and the one that is recommended by the floor specialist for use on concrete floors, is made of rubber resins and petroleum distillates, neither of which is susceptible to alkaline reaction. Certain color pigments used in this type of enamel may be susceptible to alkaline reaction but the effect is small. The rubber enamels usually dry in three or four hours, but care must be used not to treat them roughly during a tender drying period of 24 hr. However, they are easy to apply and can be painted over other types of coatings provided that certain measures are taken beforehand, such as cleaning the surface properly, removing all floor waxes, and patching, and perhaps etching, the bare spots. Etching, with a solution containing muriatic acid is required only before application of the paint to a hard, smooth concrete surface.

Hence, greater durability can be obtained for paint films applied to concrete floors if compatible enamels are used, and in this way ugly concrete floors can be made more attractive. Also, the application of one or two coats of floor wax, buffed down to assure safer footing, will not only protect the paint film from being marred by any spilled liquid that may be a solvent of the enamel, but will also result in easier maintenance. The appearance of these enameled surfaces can be further heightened and "warmed" by the application of wax stains of different colors.

SNOW AND SWITCHES—

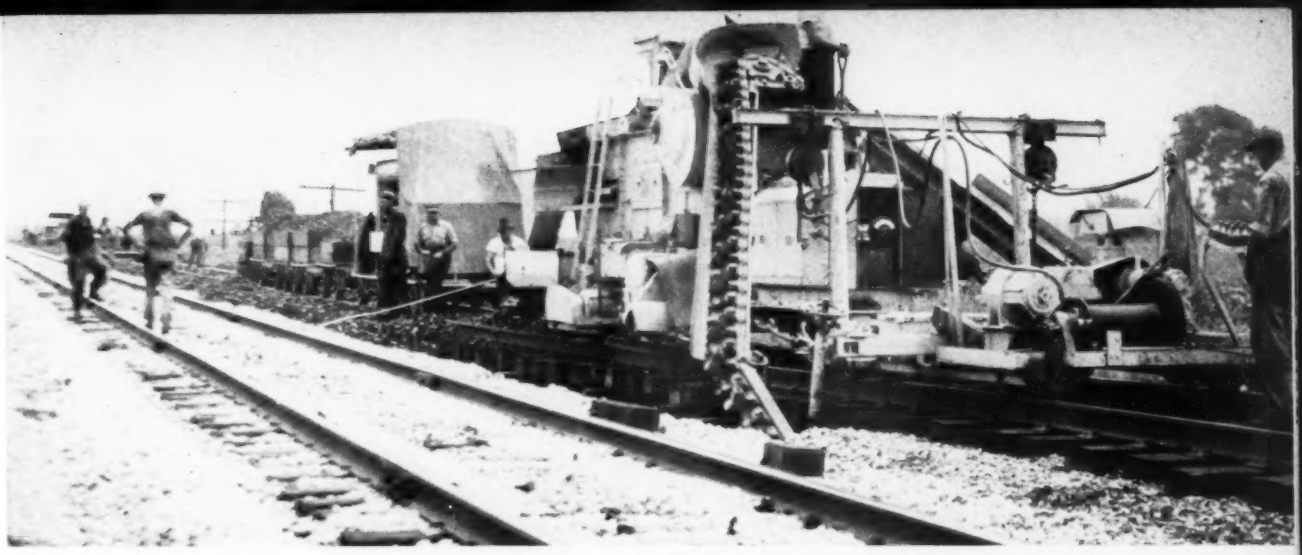
Lethal Mixture, If Safety Is Forgotten

THE FIRST snow has come and gone and the annual "shake-down" of the snow program is past. In its place, however, has been left the perennial realization that, without care in handling "operation—snowfall," serious accidents can and do occur. That fact is unalterable, for statistics are a witness to it. But what can be done to reduce the number of casualties incurred annually "fighting snow"?

One answer is inferred in the discussions of remotely controlled switch heaters in the What's the Answer department in this issue. That inference is that such switch heaters, and others as well, reduce the number of men needed to fight snow at interlocking plants. Naturally, any reduction in the number of men fighting snow lowers the potential number of accidents. However, the discussions also point out that, in spite of the effectiveness of automatically controlled switch heaters, some men are still essential, especially at multiple-track interlocking plants.

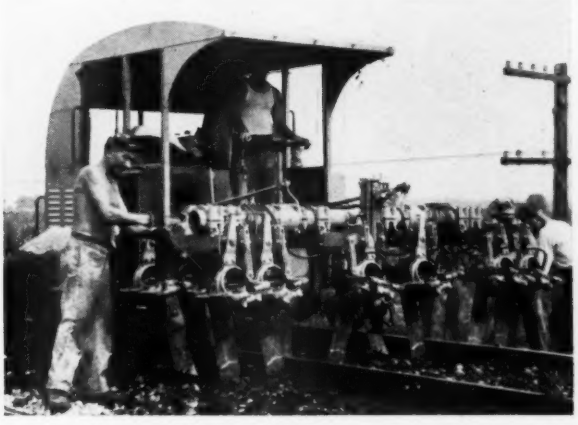
There will, of course, be a tendency to keep the number of men used as low as possible. To those who are concerned with this problem must go the warning, passed on by veteran snow fighters, that there is an irreducible minimum number of men that can safely be used in snow storms, particularly at multiple-track interlocking plants. For out of long experience and thorough study of safety statistics, some of these men have become convinced that snow sweepers or others who must work on or about "live" tracks during snow storms, should normally work in pairs to have the greatest chance of avoiding injuries. They know too that the mere fact that men work in pairs does not grant them immunity from injury unless these men also follow all other safe practices, including that of "looking out for the other fellow."

There are, of course, exceptions to this rule. For instance, many roads have long records of safe operation with individuals manning single switches in Centralized Traffic Control territory and possibly elsewhere. Only local supervisory personnel can determine when and where such exceptions can be applied. In making a choice they know all too well that there can be no compromise between safety and economy, for a single life is beyond any dollar value.



MATISA BALLAST CLEANER extracted, cleaned, and returned to track all ballast to a depth of 6 in. beneath ties. Behind it a . . .

. . . NORDBERG POWER JACK raised track to grade while a . . .



. . . JACKSON MULTIPLE TAMPER tamped all the ties solidly

Renovates Entire Ballast Section

Using a Matisa ballast-cleaning machine, the Grand Trunk Western has completely renovated the ballast section, practically down to the original subgrade, of a six-mile stretch of double track. This work, which included necessary tie renewals, was carried out at an average rate of approximately 2000 ft. of track per day.

• Along a stretch of double track six miles long on its Chicago division near South Bend, Ind., the Grand Trunk Western, with the aid of a ballast cleaner leased from the Matisa Equipment Corporation, has completely overhauled the entire ballast section, including the material in the cribs and beneath the ties to a depth of 6 in. At the same time necessary tie renewals were made, new ballast was distributed as required to fill out the ballast section, and the track was tamped with a Jackson Multiple Tamper. Because the ballast in this stretch had become badly fouled it was decided on the road that the cleaning of the entire section was necessary to assure free drainage and economical maintenance of the track.

Introduced from Switzerland about three years ago, and subsequently improved to increase its productive capacity, the Matisa ballast-cleaning machine is a large self-propelled, on-track unit designed to break up and remove fouled ballast from under and between the ties, and in the shoulders and intertrack space, to separate foreign matter from the ballast, to redistribute the cleaned rock across the track, and to deposit the waste matter alongside the track or into cars on an adjacent track—all this during a single pass over the track. The fouled ballast is broken up and removed by a continuous excavating chain consisting of a series of alternating pick-point links and shovel links. The chain is guided by an inclined triangular frame,

The digging chain, as it runs beneath track, breaks up fouled ballast and shovels it onto the conveyor shown in background

Skeletonized track just behind digging chain. Track level was maintained by wood blocks placed under ends of every fifth tie

the base of which is threaded underneath the track structure, and is driven by a sprocket at the apex of the frame. As the chain moves rapidly around the frame and underneath the track it scrapes the fouled ballast onto an inclined conveyor which raises the material to the top of the machine, where it spills onto a vibrating double screen. The waste matter falling through the screen is carried away by a conveyor and wasted. The clean stone falls from the screen into a hopper and thence onto another swivel-mounted conveyor which returns the stone to the track The excavating and cleaning unit is propelled forward by a winch on a leading car, the winch cable being anchored to the track some distance ahead.

Motor-Operated Mechanisms

All the mechanisms of the machine are driven by individual electric motors, the current for which is supplied by a 150-hp. diesel-electric generator set carried on a separate trailer car towed behind the cleaning unit. The wires connecting the generator with the motors run through the tow link. When traveling to and from the job site, the machine is propelled by traction motors at speeds up to 18 m.p.h. All the various operations of the machine are controlled through switches by a man seated on the winch car.

The base of the triangular frame can be adjusted to permit excavating ballast from depths ranging from about 3 in. to 12 in. below the bottoms of the ties. It can also be inclined laterally up to 10 deg. each way if a sloped subgrade is desired.

The work near South Bend was all carried out on dead track, train movements being diverted around the operation during the working hours. The track in this territory consists of 100 lb. rail on treated oak ties and is ballasted with limestone rock which was originally applied in 1928. In the track-renovation work a total force of about 87 men, under the supervision of a general foreman, was employed. This organization included about 40 men, a foreman and an assistant foreman in an advance gang which renewed the ties; 10 laborers and two operators directly at the ballast-cleaning machine; and about 30 men, a foreman and an assistant foreman in a tamping and surfacing gang behind the machine.

Ahead of the cleaning operation the tie-renewal gang jacked up the track 5 in. with track jacks, made necessary tie renewals, removed rail anchors, and tamped every fifth tie to hold the raise and carry the weight of the machine. As the machine moved forward extracting the ballast, wood blocks were placed under the ends of every fifth tie to maintain the level of the track, and these were removed progressively behind the machine as the cleaned ballast was returned to the track. The conveyor discharging the cleaned stone was moved back and forth across the track to distribute the ballast evenly in the cribs and on the shoulders and in the intertrack space. After distribution of the cleaned stone, the track behind the machine settled to a level about 1 in. below the original grade.

Directly behind the machine the surfacing gang, equipped with a Nordberg power jack, raised the track back to its original grade and fork tamped enough ties to hold it there until the Multiple Tamper moved up. This machine, with one operator and four men shoveling in additional ballast, then tamped all the ties solidly.

At the beginning of a day's work the machine, until it had moved forward a distance equivalent to its

The clean stone falls from the screens into a hopper and thence onto a swivel-mounted conveyor which returns it to the track.

Conveyor was moved back and forth across track to distribute stone evenly in cribs, on shoulder, and in the intertrack space

own length, i.e., until skeletonized track appeared behind it, discharged the cleaned ballast into a pile, which was then shoveled into a string of five push cars fitted with side boards. These loaded cars were then towed behind the machine until it had completed its day's work, at which time the digging chain was divided at the drive sprocket, and the right and left sides of the triangular frame were uncoupled from each other and laid down, along with the parted chain, beside the track, the base of the frame remaining under the track. After the machine had moved away, the cleaned stone carried on the push cars was unloaded in the stretch of open track lying between the last point of discharge of the conveyor and the location of the digging chain.

To avoid overtime on the part of the gang the cleaning machine was usually stopped after it had worked about 6 hr. In the remaining 2 hr. the tie-renewal gang dropped back behind the tamping machine to reapply the rail anchors and line the track while the surfacing gang tamped the track up to the digging chain. Thus the track each night was put in shape for service at reduced speed for all trains.

All mechanisms of the ballast cleaner are driven by electric motors powered by a diesel-electric generator set carried on trailer cars towed behind the machine

The winch cable used on this machine was 335 ft. long, and in a full 8-hr. day the machine was normally able to work the full length of the cable seven times, or a distance of 2345 ft. The average production for the entire job, however, amounted to about 2,000 ft. a day.

The track-renovation job described in this article was carried out under the general direction of A. N. Laird, chief engineer of the Grand Trunk Western, and R. A. Gravelle, engineer maintenance of way. In direct charge in the field were G. C. McDonald, track supervisor, and G. Stombaugh, assistant track supervisor.

Long Turntable Is Eased Into Snug

When the New York Central decided to use nine tracks of its 19-stall enginehouse at Englewood (Chicago), Ill., for handling repairs to diesel electric locomotives, the road had to install a new turntable, 135 ft. long, to replace a 100-ft. table which was too short to handle two coupled units.

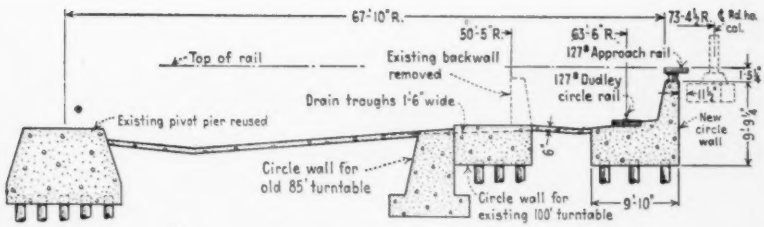
• Although it is a matter of record that the advent of the diesel locomotive has brought about the retirement of a large number of turntables, the New York Central ran into an instance where locomotives of this type required the installation of the longest turntable east of the Rocky Mountains.* This occurred recently at its enginehouse at Englewood, Ill., where 9 of the 19 stalls were taken over for servicing and repairing diesel-electric locomotives which are generally operated as two "A" units or as one "A" and one "B" unit coupled together. Since the existing turntable, which was a 100-ft. continuous-type structure built in 1927, was not long enough to bring these two-unit locomotives into the shop without uncoupling them, it was decided that a longer turntable was necessary.

While the 135-ft. turntable is sufficiently long to accommodate the two-unit locomotives, there is some overhang of the diesel couplers and the pilot beams beyond the pit wall. However, because of the close proximity of the enginehouse columns (the outer edge of the new concrete rim wall is only 11½ in. from the column footings), a table longer than 135 ft. would not have been practicable.

Although the N.Y.C does not now possess any steam locomotives weighing 615½ tons for the engine and tender, it was for this live load that the new table was designed to take care of any future eventuality and to comply with the standard A.R.E.A. recommended design. The new structure is of the continuous, three-point-support type, with built-up deck plate girders.

The maximum reaction on the pivot is 504 net tons and the design allows for a settlement of one inch either way in the relative elevations of the circle rail and the center support. The existing center pier was satisfactory for re-use but a new phosphor-bronze disc pivot, 2 ft. 2 in. in diameter, together

* Two 135-ft. turntables are known to have been installed, one on the Northern Pacific at Helena, Mont., and the other on the Union Pacific at Boise, Ida.



Left—New York Central's new 135-ft. turntable at Englewood will turn two coupled diesel locomotive "A" units. Since the pilot beams project beyond the circle backwall, wheel-detector devices are used to insure accurate spotting of the locomotives, thus avoiding the risk of damaging the enginehouse columns. A half section of the turntable pit is shown above. Note proximity of pit wall to the enginehouse columns

Quarters

with a 5¾-in. rolled steel slab was installed.

Each end of the table is carried on two two-wheel trucks in which 27-in. forged steel wheels on Torrington roller bearings are used. The table is moved by two 25-hp. Westinghouse electric motors, mounted one at each end.

The deck of the turntable is comprised of 8-in. by 10-in. by 10-ft. pre-bored, pre-cut treated bridge ties on 12-in. centers and dapped to a maximum of 9 in. Every fifth tie is 16 ft. long and alternatively project outward on opposite sides to support walks and handrails. The end tie at each end consists of an 8-in. wide-flange beam. Wood spacing blocks were applied between the ties over each girder to divert precipitation and drippings to the sides. The track rails on the table, the circle rails and the approach rails are of the 127-lb. Dudley section and are fully plated. The rails on the table are canted while the circle rails and approach rails are not.

Two operator's control houses were provided, one about 11 ft. from each end and on opposite sides of the table, thus affording control from either end. Both driving motors can be controlled from each house, although only one set of controls can be used at a time. In each house there are separate controls for each motor, permitting the table to be operated by one motor if this should be necessary. An arrangement in the controls prevents the overloading of the motors and produces a gradual rather than a sudden increase to full speed.

Means for Resisting Shock

The plans called for a new circle wall, with a 67-ft. 10-in. inside radius, founded on three concentric rows of treated piling driven on approximately 3-ft. centers for the two inner rows and 6-ft. centers for the outside row. Because of the heavy reaction at the ends of the girders, being 325,000 lb. maximum for each girder, and because of the high resistance of greenheart timber to crushing, enough of this hardwood was imported from British Guiana to produce sufficient 8-in. by 10-in. by 3-ft. 4-in. ties on 14-in. centers to support the circle rail. These short ties were partially embedded in the concrete of the circle wall at the time of construction.

Additional features for resisting shock at the ends of the turntable include a continuous 8-in. wide-flange rim beam on top of the circle wall for supporting the ends of the approach rails and the liberal use of Fabreeka pads ¼ in. thick. The pads were used between the steel end ties on the turntable and the double-shoulder tie plates, between the greenheart ties and the double-shoulder tie plates supporting the circle rail and between the rim beam and the tie plates supporting the approach rails. The rim beam was anchored to the wall with swedge bolts and set on ½ in. of Embeco cement grout.

The plan of installation, in the order of the steps involved, contemplated the driving of the piling for the circle-wall foundation; the driving of wood sheeting around the outer periphery of the circle backwall to prevent settlement of the building column footings at the time of excavation; the construction of the circle wall in consecutive circular sections, each section embodying two approach tracks; the removal of the existing backwall and turntable; and the installation of the longer, completely assembled turntable.

Aside from the driving of sheeting to protect the building columns from settlement, this plan parallels those of most railroads when replacing an existing turntable with a longer one. Most roads, however, construct falsework for supporting the approach tracks between the old and new backwalls of the two circle walls until such time as the new turntable is actually in place. The New York Central elected to use earth fill for this purpose. Hence, after the foundation piles had been driven for the entire new circle wall by a crawler crane equipped with swinging leads and using a follower, the rails on two approach tracks were cut at the proper points by means of a power rail saw; excavation of a two-track section was made; the piles exposed were cut off for a one-foot penetration into the circle wall; and the concrete circle wall for that section was constructed complete with the greenheart ties, but without the circle rail. The earth from the excavation of the adjoining section was then cast as needed over the completed wall of the first section, and the approach tracks were re-

When installing the new turntable, it was moved as a complete unit on a flat car onto the old turntable and cribbed up enough at the ends to permit removal of both the flat car and the old turntable. The new turntable was then lowered into place.

built with the recovered short pieces of rail, crossties and fastenings, and supported on the earth backfill. This procedure was continued until the entire circle wall had been completed. During this period also, a new pit drain with manholes was constructed.

Changed Out in 72 Hr.

When the new turntable was installed the facility was removed from service for 72 hr. The last pile for the circle-wall foundation was driven in late September, 1950, and the last section of the circle wall was poured in April, 1951, after a seven-week cessation of work because of inclement weather. The new turntable was fabricated by the American Bridge Company, Chicago, and was delivered by three flat cars on the first of May. The table was then moved on one flat car onto the old table, turned and moved to one of the radial storage tracks where it was blocked up so that it could be equipped with its deck (except handrails), rails and fastenings, the end trucks (which were bolted temporarily to the span), operator's cabs, controls, wiring and machinery. The center disc assembly was also suspended in position.

Service was stopped over the old turntable on the morning of May 22, the blocking was removed from under the new turntable and it was moved on its car onto the old turntable. Meanwhile, the excavation of the earth fill on the new circle wall was already being carried out by a crawler crane equipped with a clamshell bucket, and the Advance Concrete Breaking Company, Chicago, was removing the old backwall. This latter work was done by placing dynamite charges in previously drilled vertical holes and covering the wall with a rope blanket before the charges were set off. The circle rail, which was precurved, was also laid at this time but, to permit it to become adjusted in position, was not fully spiked until after a week's operation of the new turntable.

The new turntable was turned so that it lined up with one of the through service tracks, after which it was jacked up to clear its carrying flat car and supported near its ends on timber cribbing. The old table was then turned slightly and the flat car was removed. The collector ring frame of the old table was removed and a new one was installed on the new table, connections being made to the power lines. The old table was then jacked up above its center pivot castings where it was blocked and then moved sidewise from under the new table by means of snatch blocks and rigging powered by previously spotted cranes. The old table was stripped of its deck, the bracing between its girders was torch cut, and the girders were removed from the pit.

The slowest operation of the 72-hr. installation period was the lowering of the new span, using four 50-ton hydraulic jacks (the span weighed 144 tons with its deck), and the removal of the cribbing. During this phase, the lower casting of the old center pivot was removed and the new slab was set in. Since the 12 old anchor bolts were more solidly embedded than new ones could be fixed in the allotted time, the old bolts were re-used by cutting off the portion where the threads were worn and welding on new threaded studs. The lower steel center slab was set over the bolts to a true horizontal level on steel shims, after which Rust Joint Iron was rammed into place beneath the slab where it swelled to take the load. The new turntable was placed in service on May 25, 1951.

Features for Accurate Spotting

Stopping control of the turntable swing is provided by a Wagner-Electric hydraulic brake at one end. Locking devices are also installed at each end, whereby the table may be locked in alignment to the rails of a radial approach track. These devices are manually operated by means of a lever which slides two rods with wedges to bear against beveled blocks fixed at the ends of the approach rails. The rails on the table must meet those of the radial tracks within ¼ in. before locking is possible.

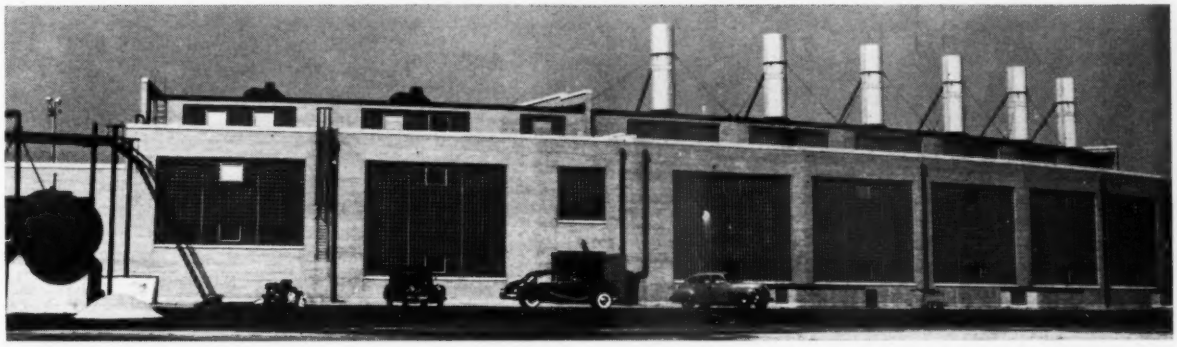
Since accurate spotting of the locomotives on the new table is essential to prevent the overhanging couplers and pilot beams from damaging the building columns, special detector bar devices were made and installed at each end of the turntable. Unless the locomotives are stopped on the turntable with ample clearance to the building columns, the devices make the turntable inoperative. This is controlled by a spring-held wheel-detector bar which, when depressed by the outer part of a wheel tread, actuates a "make-and-break" switch.

The new turntable was designed and installed under the general direction of E. A. Dougherty, chief engineer, Lines West of Buffalo, for the New York Central, while A. M. Westenhoff, engineer of construction, was in general charge of the project, G. E. Robinson, engineer of structures, was in general charge of the design, and Howard Jordan was the resident engineer in charge of field work. The Ellington-Miller Company, Chicago, was the general contractor, handling the preparatory construction work and the installation work.

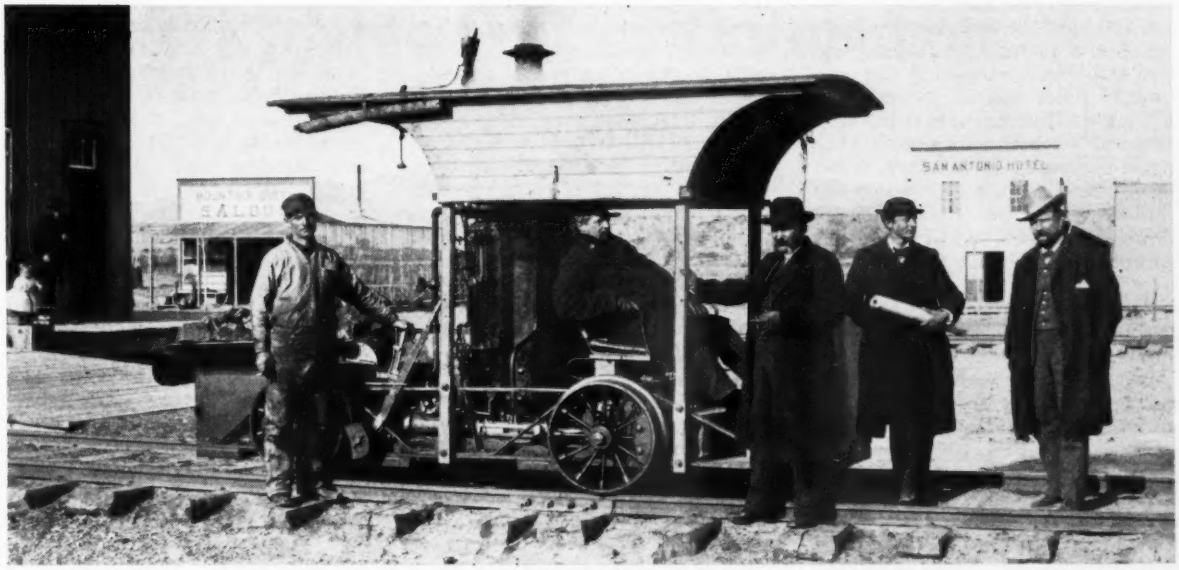
News Briefs in Pictures

INSULATED JOINTS above, equipped with Bird tie pads, have needed no maintenance for 13 months. Before pads were installed, tamping interval was 3 to 4 months, insulation life less than a year

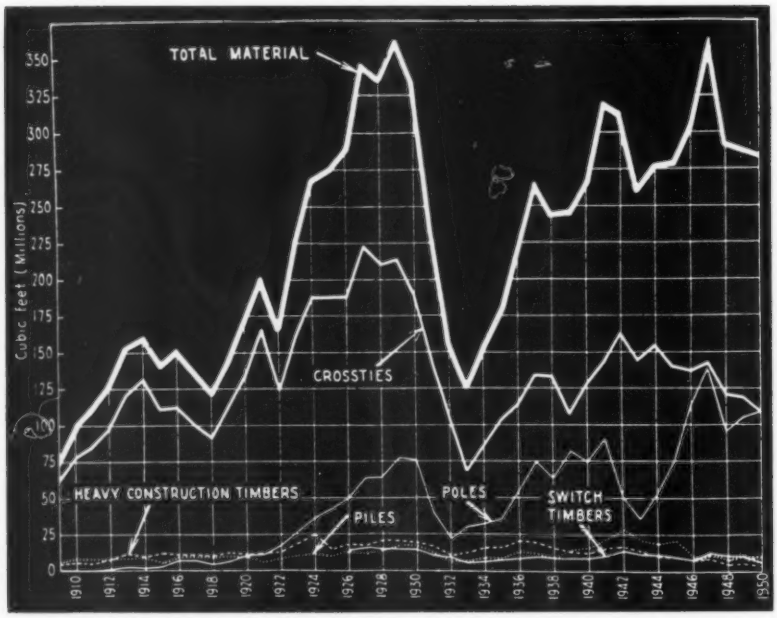
THE NEW YORK CENTRAL has roofed its station at Mackinaw City, Mich. (left), with fire-resistant asbestos-plastic shingles known as Fire-Chex—a product of the Philip Carey Manufacturing Co.



MOVING LITERALLY overnight on September 30, the Nickel Plate has shifted its locomotive terminal at Stony Island Avenue and 93rd Street, Chicago, to a brand new terminal constructed two miles to the south on a 400-acre site designated by the road as the Calumet yard. One of the facilities constructed at the new terminal is the dual-purpose enginehouse shown above, which is equipped for servicing both steam and diesel locomotives. The building is daylighted by glass-block panels



GROUPED ABOUT this intriguing inspection car are some men who worked for the Santa Fe around 1882. The one carrying a set of plans is the late C. Frank Allen, then a Sante Fe right-of-way agent and later professor of railroad engineering at the Massachusetts Institute of Technology. He was the author of the well known handbook entitled, "Railroad Curves and Earthwork." The other men include an interpreter, a roadmaster, a bridge and building foreman, and the inspection-car engineer



A graphic record of the volume of wood treated in various categories since 1909

Crossties Almost Lose Wood-Preserving Championship

• Believe it or not, wood preservation statistics turned dramatic in 1950. Dramatic because it was only by the narrowest margin that crossties retained their rank as the largest class of material given preservative treatment, exceeding the volume of poles treated by only 27,477 cu. ft. This means that the very material which spawned the wood-preservation industry when kyanized chestnut ties were installed on the old North Central railroad in 1838, and which has continued since that time to lead by a wide margin all other individual classes of material in total treated volume has at last had its supremacy challenged by a mere "upstart," poles, which until 1920 comprised one of the smallest categories of treated materials.

This condition was brought about by a 9 per cent decrease in the volume of crossties treated—to a total of 36,499,245 ties, or 109,497,735 cu. ft.—and a three per cent increase in the volume of poles treated—to a total of 6,219,901 poles, representing 109,470,258 cu. ft. Approximately 68 per cent of the crossties reported treated in 1950 were given treatment with creosote or creosote-coal tar solution and about 32 per cent with creosote-petroleum solutions. The remaining crossties were treated with various other preservatives.

Fewer Switch Ties Treated

A total of 107,684,025 ft. b.m. (8,973,669 cu. ft.) of switch timber was given treatment in 1950. This was more than 17 per cent less than the amount treated in 1949 and represents the largest decrease, percentagewise, of any category of material given preservative treatment. Creosote or creosote coal-tar solution was used to treat about 77 per cent of the switch ties, while creosote-petroleum solution was used for the treatment of about 23 per cent. In 1950, all switch ties given treatment were pressure treated.

The volume of wood given fire-retardant treatment in 1950 totaled 8,514,740 ft. b.m., or 6 per cent more than was treated in 1949. This treatment required the use of 1,768,774 lb. of dry chemicals, most which consisted, as in the year before, of chromated zinc chloride, Protexol or Minalith.

During 1950, the wood-preserving industry used 234,124,166 gal. of liquid preservatives, of which 201,744,993 gal. consisted of creosote. Of this, 63,538,557 gal. were reported as creosote coal-tar solutions. This was slightly more than was used in 1949. The use of petroleum dropped from 36,286,916 gal. in 1949 to 31,471,007 gal. in 1950 (a decrease of 13 per cent) and the amount of creosote-petroleum solution decreased about 14 per cent. The petroleum used in such solutions in 1950 was 26,147,760 gal., or 4,913,696 gal. less than the amount used in 1949.

Wood Products Treated

	1950 (CU. FT.)	COMPARISON WITH 1949 (CU. FT.)
Crossties	109,497,735	−10,577,832
Poles	109,470,258	+ 3,311,528
Lumber	27,044,078	+ 3,255,071
Piles	12,281,589	+ 1,287,775
Switch ties	8,973,669	− 1,889,163
Fence posts	8,381,778	+ 2,441,677
Construction timbers	5,777,160	− 665,100
Wood blocks	2,583,648	+ 318,252
Cross arms	1,812,252	+ 420,060
Miscellaneous	2,965,508	+ 329,473
Total	288,787,675	− 1,768,259

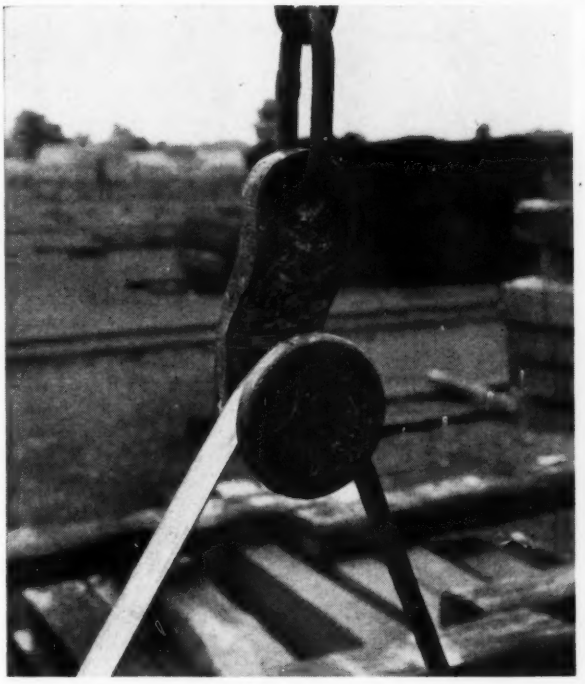
Only one or two plants reported the use of straight zinc chloride and copper naphthenate in 1950, and therefore the amounts of these solid preservatives were not listed individually in the Forest Service report but were included in "miscellaneous" preservatives. Several plants, however, reported the use of Chemonite and Green salt, and these items were given individual status for the first time. Of the 9,390,600 lb. of solid preservatives used in 1950, more chromated zinc chloride was used than any other preservative, yet the quantity of this material used (2,657,320 lb.) was about 9.5 per cent less than the amount consumed in 1949.

The consumption of pentachlorophenol also decreased 43,547 lb. to a toal of 2,245,067 lb. Likewise the consumption of Minalith dropped 32,208 lb. to a total of 165,719 lb.

All of the other solid preservatives classified were used in larger amounts in 1950 than in 1949. The use of Protexol climbed 553,504 lb. to a total of 1,231,845 lb. Similar increases occurred in the use of Wolman salts (Tanalith), copperized chromated zinc chloride, Celcure and Osmose. Of these the largest increase (557 per cent) was in the use of copperized chromated zinc chloride of which 648,566 lb. were used in 1950.

Right—Banded with a steel strap at each end, tramloads of 62 to 70 treated crossties are easily lifted into cars as units

Below—When a bundle is lifted, bands are gripped by special hooks with roller bearings that eliminate chance of crimping



Banding of Ties on Nickel Plate Reduces Cost of Distribution

By F. S. SHINN

Assistant Tie and Timber Agent
New York, Chicago & St. Louis
Cleveland, Ohio

Starting in 1950 this road has been experimenting with the banding of crossties in tramload lots and unloading them along the right of way in bundles or individually. The methods used and the savings effected as compared with former methods are described in this article which is adapted from an address presented before the recent annual convention of the Railway Tie Association.

• In 1949, our track forces unloaded from cars and stacked on the right of way 410,000 treated crossties. This required 99,619 man-hours, plus the use of a work train with a four-man crew for a total of 228 days. Based on wages in effect in 1949 (which have been increased since then), and $130 per day for the work train and crew charged to unloading crossties, the cost of unloading and stacking these ties amounted to 43.6 cents per tie. Based on present wage rates, plus a charge of $150 per day for the work train and crew, the cost would have been 45.1 cents per tie.

It may seem to some track men that 99,000 man-hours is an excessive amount of time for unloading 410,000 crossties. In the first place, it is my opinion that quite a few track men who have never made a complete analysis of the total time involved in unloading and distributing crossties would be very much surprised at learning what it actually costs to unload and distribute them. Then, too, it must be remembered that the Nickel Plate is a single-track railroad which necessitates that the work train go into a siding to clear for freight and passenger traffic from both directions. Also, unlike some railroads which leave their ties lying along the right of way where they are dropped at time of unloading, it was our practice to place them neatly in stacks of 5 to 50 ties each after the work train had been dismissed.

We followed this practice not

only for the effect of neatness along our right of way, but primarily because our normal practice has been to ship and unload the major portion of our crossties during the winter months. This helped to reduce labor turnover by keeping the men on our payroll during the winter months unloading treated ties and stacking them in small quantities along the right of way where they were to be installed the following spring and summer.

Better Method Sought

We feel that this practice has, in the long run, resulted in the most economical method of unloading and distributing our treated crossties. However, when the decreasing effectiveness of labor, coupled with increasing wage rates, had raised the cost of handling ties to the point where we found it was costing us in excess of 40 cents per tie to unload and distribute them, we decided it was time to develop a better method.

We had, for the past few years, been giving considerable thought to the banding of treated ties before shipment with steel strapping in such manner that would permit an entire tramload of ties to be picked up by the bands with a locomotive crane and set on the ground. However, the chances of personal injury due to the possibility of breaking a band presented a hazard which we were unwilling to risk without some rather comprehensive tests.

After considerable thought we decided that, by simplifying and improving methods that had been tried out by others and by using a steel band .065 in. thick, with a sealer that will not cut or crimp the edges of the bands, we would be justified in experimenting with the method on a small scale. Consequently, we banded 10,000 treated ties in tramload units of 62 to 70 ties each and unloaded them in October 1950 on the Cleveland division. These were unloaded in tramload units by picking up each load by the bands with a locomotive crane.

We decided it is important that, when loading the banded ties, they must be picked up by the bands, and that the bands should be placed back 12 to 15 in. from the ends of the ties. Another "must" is the loading of the ties crosswise in the car. To load them endwise will in many cases result in the ends interlacing with each other due to shifting while in transit.

Early experience developed the fact that the ordinary S-shaped or curved hooks, because they crimp the bands badly, increasing the risk of breaking them, are not satisfactory for picking up the ties by the bands. A flat hook with a roller bearing and having a guard to prevent the band from slipping off the hook has been designed. This hook is shown in one of the photographs. It is easy to fasten to, and unfasten from, the bands and eliminates any chance of friction or crimping the bands. Two of them are required, which are attached to the ends of a single-arm spreader for loading ties into cars, and four of them, one attached to each corner of a rectangular-shaped spreader, are needed when unloading the ties and distributing them along the right of way.

Unloading ties for individual distribution, using a rectangular spreader. Note in foreground how leveling ties below sides of car takes up apparent excess band slack

Unloading 10,000 Banded Ties

The first 10,000 ties we banded and loaded into cars for unloading on the right of way in October 1950 were not distributed individually. We set the bundles off on foundations of used ties at intervals of from one to two thousand feet for the section foremen to use as needed. At the time we banded these ties, we planned on distributing them singly at the points of installation, but by the time they arrived at destination we had decided against this practice. Exact records were not kept but it is the opinion of the engineer of track, who supervised the unloading, that the 10,000 ties were unloaded with a four-man crew plus a foreman and a crane operator, and a four-man work-train crew, in approximately the same time required by a 17-man crew and foreman, and a four-man work train crew, when unloading the ties one at a time by hand. The bands, including the labor of application, cost the equivalent of $.056 per tie. We have not yet determined whether or not it will be practical to return these bands to the treating plants for use on additional shipments. However if we do not do so, they have a sale value in today's scrap steel market that will be slightly in excess of the equivalent of $.01 per tie, making the net cost of the bands $.046 per tie.

After unit load has been swung out and held against side of car, individual ties are pulled out of the bundle with a tie pick and dropped at the point of installation

From the pictures that show the loading of ties into cars it may seem that we used an excessive amount of strapping in making oversized bands. It will be noted, however, when the rectangular spreader was used to permit the ties to be unloaded and distributed singly, that most of the slack is taken up by the two extra hooks. It has been demonstrated that, to permit the ties to be pulled from the bundles easily, the spreader should keep the hooks as far apart as the outside diameter of the bundle, and that there should be approximately 18 in. clearance between the top of the band and the top layer of ties so that the bands won't pinch and bind the ties. Then, too, there must be enough slack in the bands so that, when the ties are placed in the cars, they can be levelled down so that the top ties will not project above the gunwale of the car.

In cases where we have advance information that the ties are to be set off the cars and left in tramload units along the right of way, to be distributed later, we will use about two lineal feet less of strapping per band, but even in these cases the bands must be of such diameter that there will be enough slack to level ties down to the gunwale of the cars.

Distributing Banded Ties

In May 1951 we banded 14,503 main-line ties, grades 3A, 4 and 5, at Orrville, Ohio, and distributed them along the right of way on the Wheeling & Lake Erie district. On divisions "One" and "Three" 10,200 of these ties were unloaded from cars and left in tramload lots spaced in such manner as to result in the shortest carry by the section men at the time of installation. On division "Two" 3,303 were unloaded singly and spot placed approximately 110 ties per mile. In this operation the tramload units were picked up by the bands with a locomotive crane and swung out and held against the outside of the car a few inches above the ground. With the work train moving at a speed regulated so that the desired number of ties could be unloaded, two men walked behind the tramload of ties with ordinary tie picks and pulled the ties out of the bundle, dropping them at the point of installation.

The point has been made that it is not considered good practice to use a tie pick on treated ties. Generally speaking, we agree and, except in unusual circumstances, discourage this practice. However, for several reasons we feel justified in using tie picks when distributing bundled ties. In using a pick in this operation, the point of the pick is driven into the tie approximately 3 in. from the end—never more than 5 in. A very large percentage of our ties are red oak. Our standard treatment is slightly in excess of 8 lb. per cu. ft. of a 60-40 solution of creosote coal tar by the Rueping process. It is impossible to treat a red oak tie with 8 lb. per cu. ft. by this process and leave untreated wood as close as 3 to 5 in. from the end of the tie. In many cases white oak, gum and maple will take as much as 3 to 5 in. end penetration. The possibility of slight damage occurring because of exposed untreated wood in the very small percentage of ties in which this could happen is so remote as to be of small consequence compared to the saving involved.

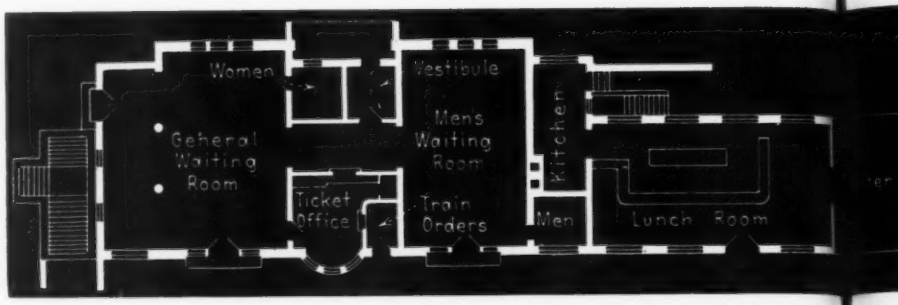
Saves $0.115 per Tie

The 3,303 ties were unloaded and distributed to the points of installation at a total labor cost of $0.29 per tie, to which must be added the $.046 per tie for the bands, a total cost of $0.336 per tie. This compares with the cost of $0.451 per tie based on 1949 performance.

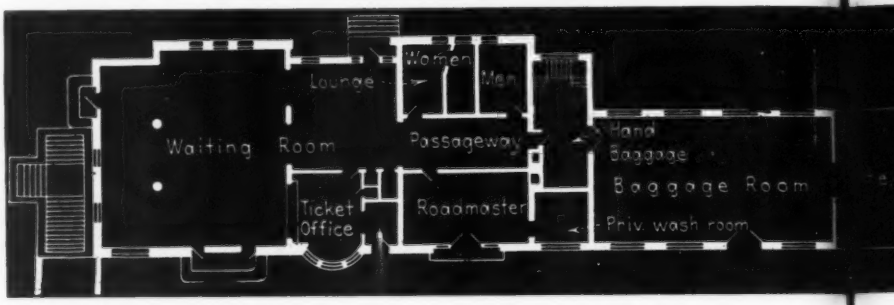
In considering the saving of $0.115 per tie, it must be remembered that our men were totally unfamiliar with the new method. At first they could scarcely comprehend what it was they were supposed to do. The men in the car fastening the four hooks to the bands were slow and clumsy at it —not from a natural clumsiness but because it was something they had never done before. The crane operator at first had trouble getting the proper signals. The men on the ground, through inexperience, had trouble in pulling out the ties and dropping them in the desired places. As each car was unloaded the operation became smoother and the coordination better. We can easily foresee that, with practice and experience, the labor cost of $0.29 per tie will be very noticeably reduced.

How the C. & N. W. Modernized a College-Town S

Interesting possibilities suggest themselves when consideration is given to the refurbishing of old stations. An antiquated but structurally sound station of the Chicago & North Western at Ames, Iowa, provided an excellent opportunity for the exercise of ingenuity in this direction.



The original layout of the Ames station is shown in the floor plan above. The . . . plan



• Iowa State College grads visiting their alma mater at Ames, Iowa, will rub their eyes in disbelief when they pass through the passenger station there of the Chicago & North Western. That they will experience this reaction is due to the fact that the station interior has recently been completely modernized to bring it up-to-date architecturally as well as to adapt it to present-day needs.

In former years, it was the practice for the college to celebrate "excursion day," during which thousands of people came from all parts of the state in special trains. On this occasion, and also at the beginning and end of the college term each year, the capacities of the rooms in the station's detached baggage-and-express building would frequently be overtaxed, so that it would be necessary for trunks and other baggage to be piled high under a shelter shed that connected this building with the station. However, following the discontinuance of "excursion day," coupled with the increased use of the automobile, there was a reduction in the peak loads that had to be handled at the station, with the result that the existing facilities, especially those for handling baggage, were more than adequate to serve the reduced needs. Also, since the station was about 50 years old, it had become outmoded in appearance, especially on the interior. Hence, because of the importance of the city, it being the headquarters of the Iowa State Highway Commission, and because of its close proximity to transcontinental travel to and from Des Moines, Iowa, the state capitol, it was decided to undertake a modernization program to improve the appearance of the station and to bring its facilities into harmony with current requirements.

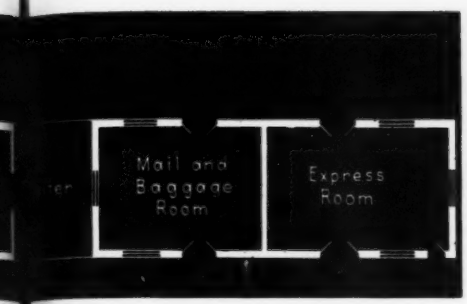
The station is of brick construction on a masonry foundation. Its floor plan consisted essentially of two large waiting rooms with contiguous rest-room facilities, a ticket office of the fully enclosed type, a kitchen, and a large lunch-dining room. A partial basement, reached by an outside stairway, housed the heating plant. Space for the mail and baggage business, and also for handling express, was provided in two rooms in the detached building. With this arrangement to start with, the question rose as to what should be done to modernize the station.

How Layout Was Changed

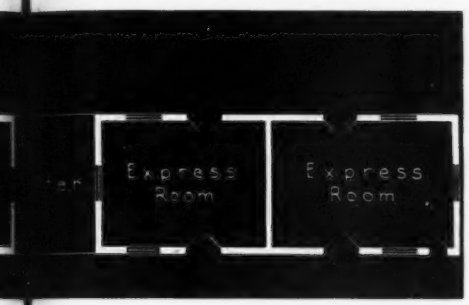
It was decided that two waiting rooms were unnecessary and old-fashioned, and that one large waiting room, suitably decorated and furnished, would fit present-day needs. Also, a modern ticket office and new rest-room facilities were a "must." As a consequence, it was decided to do over the ticket office in its present advantageous location and to locate the rest rooms in a portion of one of the old waiting rooms where the piping would be easily accessible from the basement area. Another decision was to convert a portion of the same waiting room into an office for the roadmaster who needed improved quarters, and to use the space in between the two converted areas as a passageway for reaching the relocated rest rooms and a hand-baggage room converted from the old kitchen. Also, the lunch-room facilities, which were abandoned several years ago, would be converted into a baggage room. This would permit the baggage room in the detached building to be vacated by the railroad, thereby making it available for the use of the Railway Express Agency which had expressed a desire to move its downtown office to a location in the vicinity of the railroad station.

As can be seen from the accompanying floor plans the waiting room that was retained for this service was enlarged by eliminating the vestibule and relocating the women's rest room. This change necessitated the installation of steel I beams to support the roof structure where partitions were removed. A high-arch ceiling in a portion of

Station



plan below shows the new arrangement



To an old grad, this spacious waiting room hardly seems part of the station he knew

the waiting room was left in place, but all plastering was removed from it as well as from the flat ceilings, rock-wool insulation was installed, and new plaster on metal lath was applied. The semi-circular windows at each end of the vaulted ceiling were fitted with Flutex glass held in place with wood beads. All existing wainscot was removed and replaced to a height of 7 ft. with ¾-in. birch veneer plywood. Also, all doors and windows throughout the building were replaced with new ones of lesser height and of a design and material to harmonize with the modernization plan.

New Floors, Lighting, Furniture

A terrazzo floor, with brass divider strips, was laid over the old maple flooring in the waiting room, and this type of flooring was also used in the women's lounge, toilet rooms, ticket office and telephone booth. Fluorescent lights on suspended hangers were installed throughout the building, while in the waiting room additional banks of fluorescent lights were placed in troughs located on each side along the bottom of the arched ceiling. Thus, these fixtures give indirect illumination. The doors, windows and birch veneer plywood in the waiting room were shellacked and varnished. The walls above the wainscot were painted with a light shade of green, while the ceilings were painted in a sun tone color. Colorful tubular upholstered chairs and setees were installed and appropriate room-identification and directional signs, covered with a red Scotchlite reflective coating, completed the modernization of the public areas.

Somewhat similar treatment was given to the ticket office, and in addition a counter with built-in cabinet was constructed along one wall and panels of Flutex glass were installed along this and another wall facing the waiting room. A small entry, adjoining the ticket office and formerly used by conductors when picking up train orders, was converted into a stationery room for the agent in lieu of the space taken from his office to provide recesses for parcel-checking lockers and telephone booth.

The birch veneer wainscot was carried into the passageway and into the women's lounge. New modern plumbing fixtures and metal compartments were used in both rest rooms, and a built-in vanity with mirror was constructed in the women's lounge. A new drinking fountain was placed in the passageway. A new oil-fired steam boiler replaced a hand-fired steam boiler in the basement, and a two-pipe heating system, complete with convector-type radiators and electrical controls, was installed to replace the one-pipe heating system.

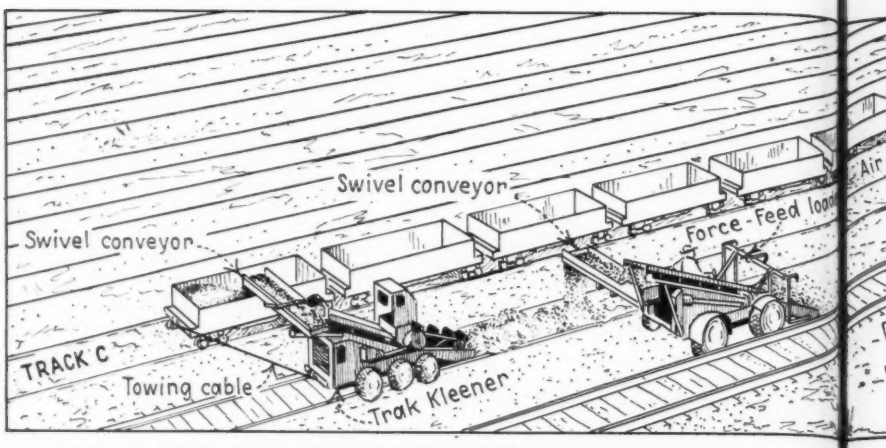
Nor was the exterior of the station neglected. New concrete steps and landings were constructed at the three waiting-room entrances. A portion of the outside stairway to the basement was filled in and a new cover placed over the remainder of the opening, while an interior stairway to the basement was built at one end of the new hand-baggage room. The brick walls of the station proper were steam cleaned, all masonry was tuckpointed, and all exterior doors, windows and trim were painted.

Other Changes

New concrete platforms were constructed and, in this connection, the canopy of the island platform was jacked up to conform with the track raises made since the original construction and the superelevation of the curve on which it was located. Mercury-vapor lights on poles were erected along the platforms and new modern incandescent fixtures were installed under the shelters and canopies. A new driveway was constructed to reach the platforms and the taxi entrance to the station. Not to be outdone, the City of Ames purchased a landscaped area behind the station and converted it into a modern paved parking lot.

This project was carried out under the general direction of E. C. Vandenburgh, chief engineer, and under the direct supervision of H. L. Barr, division engineer. Plans were prepared by L. C. Winkelhaus, architectural engineer, and W. F. Armstrong, assistant architectural engineer.

When the record high waters that occurred in the Kansas City area in July had receded the Rock Island found that, in addition to other serious damage, its large hump yard at Armourdale, Kan., was buried under a heavy deposit of silt. How this silt was removed with the aid of special equipment is told in this article.



Diagramatic sketch of method of operating the two off-track machines as a team . . .

Flooded Yard Results in

• What would you do if you had a 40-track hump-retarder classification yard which had become covered with silt to a depth of as much as 8 in. above the top of rail? This is one of the major problems that faced the Chicago, Rock Island & Pacific at its Armourdale yard, Kansas City, Kans., following the record floods in the Kansas and Missouri rivers that engulfed the Kansas City area in July.

Maintenance officers on the Rock Island whose responsibility it was to remove the silt were quick to realize that, although conventional equipment would be useful up to a point, the most economical answer to the problem depended on the adaptation and proper use of special machines. What they did was to obtain a Pettibone Mulliken Trak-Kleener and an Athey Force-Feed loader, which were put to work as a team for picking up and loading the silt into dump cars after the tracks had been opened up with a Jordan spreader. Although these particular units of equipment carried the major share of the burden of cleaning the silt from the tracks in the classification yard, it must be added that a variety of other types of equipment, mentioned later, was also found useful in helping to remove the accumulation of mud from the yard area generally.

The Rock Island's Armourdale yard extends generally in an east-west direction. The most westerly unit of the facility is the retarder yard in which the hump is located at the west end. East of the classification tracks are the receiving and departure yards, the main yard office, an engine terminal, a rip track and other facilities.

Trouble Started July 13

The high-water troubles in Armourdale yard started early on the morning of July 13 when the Kansas river, swollen by heavy rains in its watershed, burst through its dikes. All of the yard was soon under water, which kept rising until it reached within 18 in. of the crest of the hump. In the classification yard, or "bowl" as it is known locally, the water reached a maximum depth of 14 ft., and further east, in the direction of the river, it was even deeper.

After the dikes broke it was four days before the water had receded sufficiently to permit the damage to be assayed and the rehabilitation work to be started. The yard was found to be a shambles. Although very little washing occurred in the bowl, the tracks there, as previously stated, were covered with silt to a depth of as much as 8 in. above the top of rail. However, of the trackage east of the bowl, where swift currents prevailed, about 50 per cent was badly washed, and about a mile of the joint Rock Island-Union Pacific main line, which skirts the north side of the yard, was washed out to a depth of 3 to 12 ft. On the ground floors of all buildings there was a deposit of about 15 in. of mud.

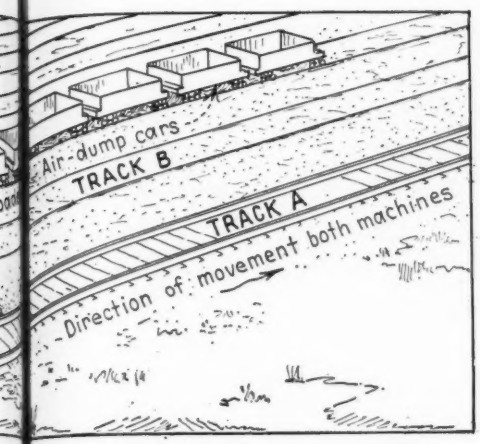
An appalling amount of work was involved in restoring the yard to service. There were two principal aspects to this work, namely, (1) the restoration of tracks that had been washed out and (2) the removal of silt, not only from the tracks but also from the building interiors and the areas around them.

An interesting sidelight of the track-restoration work was the use of mahogany lumber in cribbing up the double-track main line at locations where it had been washed out. Mahogany may seem to be an expensive material to be used for this purpose, but it had happened that a large stock of this wood in a nearby lumber yard had been carried away by the flood waters, and, since contact with the water had rendered it unfit for normal use, the lumber was made available to the railroad for track rehabilitation work. A measure of the amount of washing that occurred in the yard is the fact that about 500 cars of ballast were dumped in the track restoration work.

Many Men and Machines

To get the tracks back into service in the shortest possible time the railroad greatly expanded its labor force in the yard and also put to work every available piece of equipment that could be adapted to this work. At the peak of the restoration operations there were about 300 men at work, including a considerable number of clerical and yard service employees who would not be needed for their regular jobs until the yard could be restored to operation.

Practically all of the equipment used in the rehabilitation work was engaged in silt and mud-removal operations. This equipment included six crawler cranes equipped



. . . in cleaning silt from "bowl" tracks

A turnout in the "bowl" after mud had been removed by hand to permit use of hump

Operation Mud

The unstable silt became soupy following rainfall but hardened rapidly afterward

with either clamshell or dragline buckets. Of these units three were owned by the railroad and three were obtained from contractors. Other equipment supplied by contractors included about 30 dump trucks, approximately 10 crawler tractors with front-end loaders, and about 12 crawler bulldozers. Also several wheel-mounted tractors with front-end loaders were put into use primarily for loading mud and silt around the rip track and the machine shop.

Up to a point the silt-removal operations were simply a matter of bringing this material together in piles and loading it into dump trucks with the clamshells, draglines, or front-end loaders. In the bowl, however, this procedure could be followed only until the tracks were put back into service, after which primary dependence for removing the remaining silt had to be placed on the Trak-Kleener and the Force-Feed loader.

Procedure in the Bowl

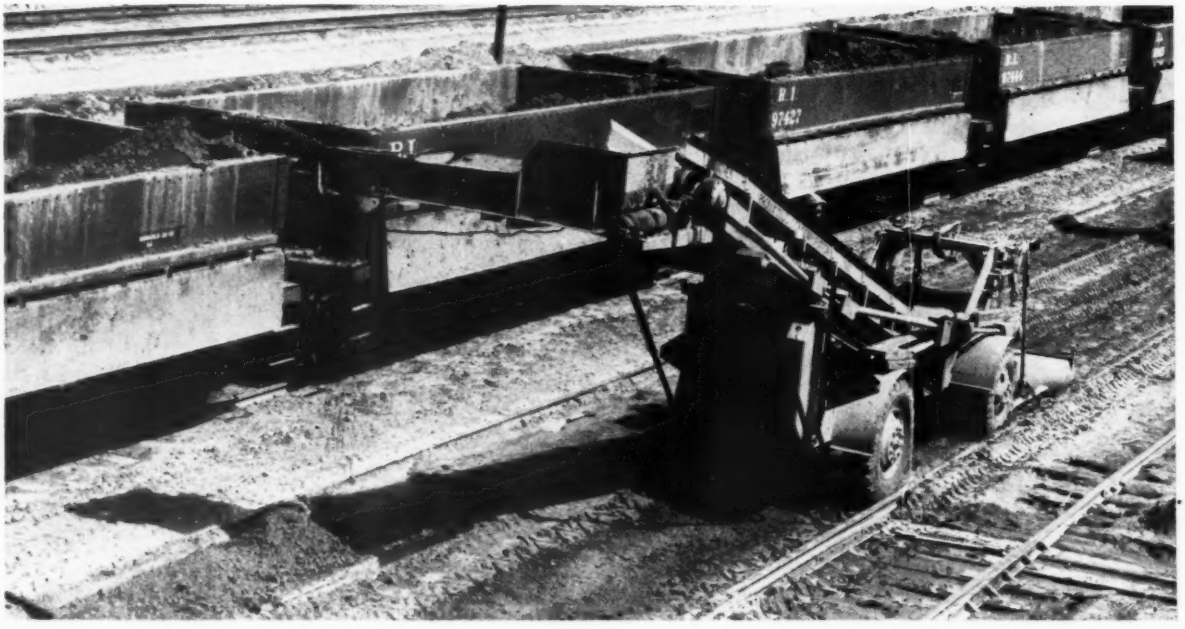
One of the objectives of the rehabilitation work was to get the hump back into service as quickly as possible. The initial phase of this work was to open up the tracks with a Jordan spreader, plowing the excess material into the intertrack spaces. In the beginning this material was loaded into dump trucks by the front-end loaders, the draglines and the Force-Feed loader, but after the tracks had been placed in service the use of trucks had to be discontinued in favor of dump cars.

The north 11 tracks of the bowl were opened for service by July 22, and the hump was put back into operation on that date. The opening of the bowl tracks with the Jordan spreader then proceeded progressively across the yard until all classification tracks were in operation by August 5.

In the meantime the Force-Feed loader and the Trak-Kleener were put to work cleaning the remaining material from the tracks that had been put back into service. Both of these machines were purchased by the railroad especially for use in cleaning silt from the tracks in Armourdale yard. The general principle of the machines is the same. Both are mounted on rubber tires and each has a mechanism at the front end for picking up dirt which is lifted by an inclined conveyor belt to a swivel-mounted conveyor at the rear of the machine. The essential difference between the two units, insofar as it concerned the work at Armourdale yard, was the fact that the swivel conveyor at the rear of the Trak-Kleener is of such height that material passing on to this conveyor from the inclined conveyor may be loaded into standard dump cars. Since the Force-Feed loader was not designed especially for track-cleaning work the swivel conveyor on this machine was not quite of sufficient height to permit the loading of dump cars.

For the track-cleaning operations at Armourdale yard a standard or

Picking up material from the intertrack space, the Force-Feed loader dumped it between the rails of one of the adjacent tracks



Depending on consistency of material, it was sometimes necessary to make several passes with both machines to get complete job

typical operation was worked out involving the use of the Trak-Kleener and the Force-Feed loader as a team. For this operation 20 air-dump cars were used, of which half had a capacity of 20 cu. yd. and the other half a capacity of 30 cu. yd.

The typical operation required that three tracks of the yard be taken out of service. For the purpose of describing the operation the tracks occupied will be referred to as Tracks A, B and C (See accompanying perspective drawing). Working ahead of the Trak-Kleener, the Force-Feed loader would pick up the silt in the intertrack space between Tracks A and B and drop it between the rails of Track B. Moving along behind the Force-Feed loader the Trak-Kleener would pick up the material between the rails of Track B and deliver it to the string of air-dump cars on Track C.

When 10 of the air-dump cars had been loaded in this manner they were taken by the work-train engine to a tail track west of the hump for dumping. However, the absence of the work-train engine while moving the dump cars involved no interruption of the work, since the Trak-Kleener was found to have sufficient power to

Trak-Kleener picked up material from between rails and deposited it in dump cars

In charge were F. J. McDaniel (left), asst. roadmaster; G. W. Williams, roadmaster

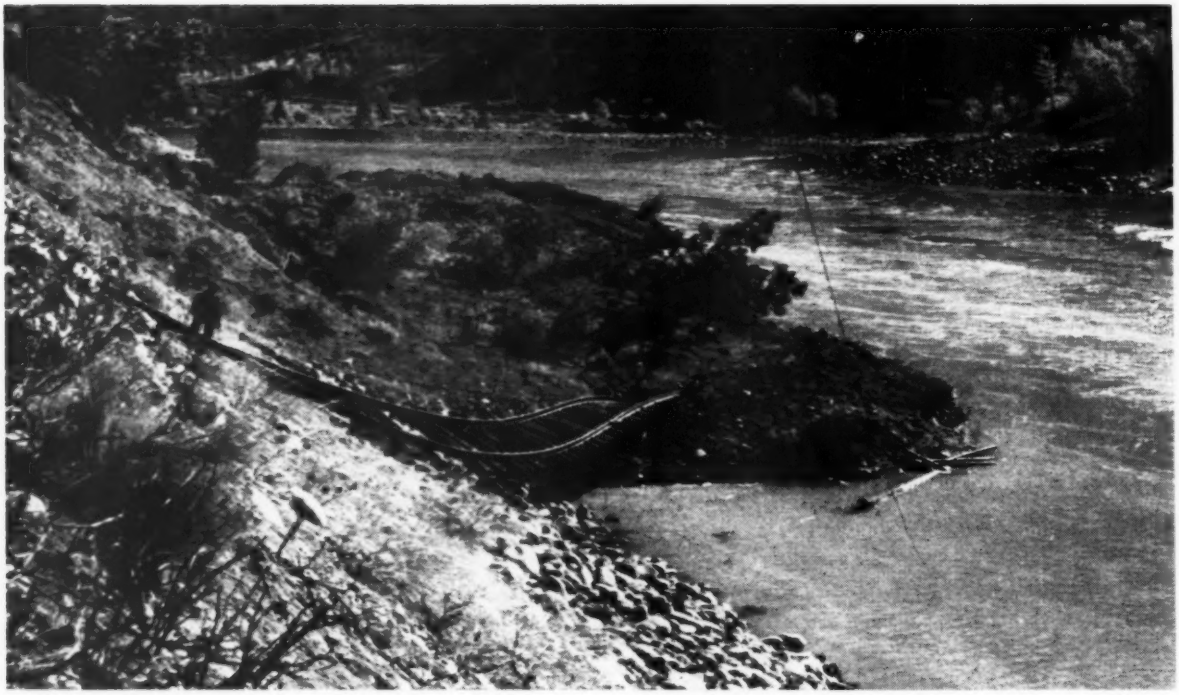
move the other 10 dump cars as well as to perform its regular operation. When the work train had left with the first 10 loads a cable was stretched from the Trak-Kleener to the rear car of the remaining 10 empties. As the Trak-Kleener moved along Track B it pulled the string of air dumps along on Track C, filling the rear car first. When this car had become filled the cable was lengthened to permit the filling of the second car. The total length of the cable was such that three cars could be filled with the one connection to the rear car. When these three cars had become full the cable connection was made to the rear end of the fourth car and the operation repeated.

The objective of the track-cleaning work was to remove the material between the rails down to the tops of the ties with the Trak-Kleener, and to remove the material in the intertrack spaces to a depth of 3 or 4 in. below the tops of the ties with the Force-Feed loader. Conditions were frequently such that it was necessary to make more than one pass of the machines to accomplish these objectives, sometimes as many as four passes being required. The quantity of material to be handled was one factor in determining the number of passes needed. Another was the consistency of the silt. During practically the entire time the yard-cleaning operations were under way rainfall was abnormally high. When the silt was wet it was more difficult to handle, and required extra passes of the machines. If several days should pass without rain the material hardened rapidly, thereby also slowing up the work.

Sometimes following a rainfall the material was found to be so unstable that it was not possible to operate either of these machines until some drying had taken place. On these occasions the loading of the material from between the intertrack spaces was carried on with a crawler clamshell mounted on a flat car. When this procedure was followed the Trak-Kleener was used as a towing unit to pull the clamshell and the air-dump cars. Later on, when the material had dried out sufficiently, the Trak-Kleener would have to be operated over the same track again to pick up and load the silt from between the rails.

When conditions permitted the track-cleaning equipment was worked 9 hr. a day, 6 days a week. A maximum of 33 air-dump cars was loaded in one day, with the average being about 27 cars. It was estimated that a total of about 50,000 cu. yd. of material was removed from the yard tracks with this equipment before the job was finished. Hampered as it was by frequent rainfall, the work of cleaning the yard tracks with the two machines was not completed until about October 1, and even then a considerable amount of finishing work remained to be done. In fact, in view of the muddy conditions that prevailed, it was frequently necessary to resort to manual labor to clean the mud from the tracks.

The yard-cleaning operations described in this article were carried out under the direct supervision of G. W. Williams, roadmaster at Kansas City, and F. J. McDaniel, assistant roadmaster.



In the night of May 1, 650 ft. of Canadian National main line was swept away by one of the biggest slides in the road's history

Equipment to the Rescue . . .

With aid of bulldozers and pile drivers, large blockage involving the main line of the Canadian National is cleared quickly, permitting restoration of traffic in three days

• Eleven bulldozers and two pile drivers were brought into action to cope with one of the biggest landslides—containing 1,000,000 cu. yd.—ever experienced on the main line of the Canadian National, thereby making it possible to restore service in three days. The slide occurred in British Columbia on the Ashcroft subdivision where the line runs along the north bank of the Thompson river, 81.5 miles west of Kamloops, B.C.

At the location of the slide, the track had originally been laid on a steep sidehill, about 50 ft. above the normal water level of the river. For a vertical distance of approximately 700 ft. above the track and horizontally about 1000 ft. the material consisted of gravel, silt and sand. Beyond this, to the north, the mountain consists of solid rock with a straight vertical face rising about 200 ft. above the top of the silt formation.

Last winter the snowfall was exceptionally heavy at the higher elevations in the mountains in the vicinity. Although there was no indication of the presence of free water at the slide, after it occurred, it is assumed that the melting snow drained along the rock face down to river level and that the moisture in the lower level of the sidehill weakened it enough to permit sliding to occur.

The first indication of motion in the sidehill was noticed at 7:15 p.m. on May 1, by an auto-camp operator along the highway on the opposite side of the river. He immediately relayed word to operating officials of the Canadian National via Canadian Pacific facilities at Spence's Bridge, about seven miles to the east. Traffic over the line was immediately halted.

During the early hours of the slide, the sidehill fill held and the debris flowed over the track. During the night, however, movement increased and the fill slid into the river taking the track with it. At one time the slide blocked the Thompson river for nearly half its width and stretched approximately 650 ft. along the track. A further indication of the slide's magnitude is the fact that the weak spot, where it broke away from the mountain, was about 800 ft. back from the track and 700 ft. above it.

Officers of the road immediately began to organize the big clearing job required to restore service on the main line with minimum delay. As it happened, Major J. L. Charles, chief engineer, Western region, was in the vicinity on an inspection tour. He was soon at the scene of the slide, with R. H. Robertson, general superintendent of the British Columbia district, and District Engineer St. J. Munroe. They were

To clear a new grade and to stabilize the slide with piling, 11 bulldozers and 2 pile drivers were quickly brought into action

Clears Million-Yard Landslide

accompanied by Superintendent D. G. Kissick and Division Engineer J. L. Cann, of the Kamloops division. Under their direction a force of 100 men and a fleet of 11 bulldozers were mustered during the night while the slide continued to move.

Movement had subsided sufficiently in the early morning of May 2 to start the work of clearing a grade and stabilizing the slide by driving piles to support the toe of the slope. The "dozers" employed in this work consisted of railway machines which had been working at various points on the Kamloops division and others which were quickly obtained from construction companies in the vicinity. This sizeable contingent of machines included one D-6; six D-7's; two D-8's and two TD-14's.

The bulldozers moved a tremendous amount of material while working without interruption from the morning of May 2 through May 4. During that time they not only established a new grade on which the track could be rebuilt, but they trimmed the sidehill slope above the track to minimize the danger of the detritus later rolling down onto the track. By May 4 the slide was sufficiently stabilized to permit a work train to ballast the track which had been laid on the new grade. Surfacing and lining followed and by 6 p.m. that night the main line was restored.

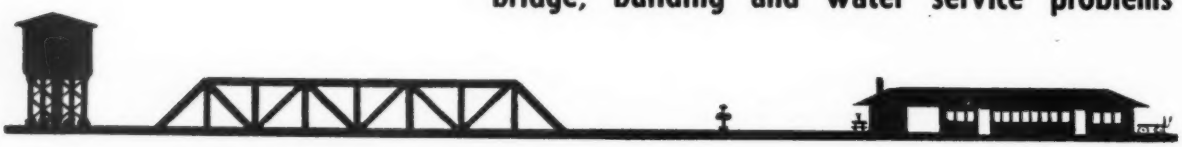
The driving of the piles along the toe of the slope was considered an important factor in stabilizing the slide so quickly. These piles were driven along the approximate original shore line of the Thompson river by two "skid" drivers working toward each other from each end of the slide. After the piles were driven, 6400 cu. yd. of gravel and 17,000 cu. yd. of rock were placed along them at water level to resist the movement of the sliding material above.

The Thompson river flows swiftly at the point of the slide and by the time pile driving was completed, all of the slide material forced into the river had been washed away up to the piling.

By afternoon of May 3, a new grade had been made and track laying started

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Railway Uses for Prestressed Concrete

What are the advantages and disadvantages of prestressed concrete for railway bridges? Explain. To what types of structures is it most adaptable? Why?

Better Structures for Less

By L. H. CORNING
Manager, Structural and Railways' Bureau, Portland Cement Association, Chicago

There are several advantages in using prestressed concrete in railroad bridges. These advantages can be divided into those which result from the use of prestressed concrete in the structure itself and those which are associated with such use.

The first group includes a reduction in the depth of beams and girders and in the thickness of the slab. This means less dead load, less material and more underclearance. It includes greater span-to-depth ratios and increased resistance to flexure. It includes greater rigidity under working loads and greater flexibility under excessive overloads. It means that higher strength concrete can be used more efficiently. It also means that exposed concrete will be more durable because it is crackless.

Other advantages of prestressed concrete accrue from its use in grade-separation structures and bridges where a reduction of a few inches to a foot or more in the depth of the deck results in lower costs for retaining walls, fills, drainage structures, approaches, right of way, connecting trackage, and damage to adjoining properties. It permits the use of longer spans, thereby reducing the number of bents required, with resultant savings in both labor and materials.

Prestressed concrete is particularly adaptable to precast bridge elements and other such products used by the railroads. It is especially suited to precast slabs used in concrete pile trestles. Prestressing makes it possible to use slab depths equal to or less than those of steel spans of the same length, or to reduce the depth of conventional reinforced concrete slabs. Thus slab weights can be reduced and underclearances increased or longer spans can be used with fewer bents.

Another railroad structure that lends itself particularly well to prestressed concrete is the overhead highway bridge. Here again span lengths can be increased and deck depths reduced to give increased clearance. Bridges of this general type have been designed and built using individual concrete masonry blocks prestressed together to form beams which can be set in the same way as structural steel members. These bridges have cost less than other types of construction.

The construction of prestressed, precast bridges and slabs differs from that of conventional, reinforced-concrete units only by the prestressing operation. This operation is simple and requires nothing new in equipment and can be done with ordinary labor forces. The units can be handled and placed the same as any other precast concrete unit. When a bridge deck is comprised of several individual members they are generally prestressed laterally to tie them together for the same purpose that diaphragms or chord bolts are used to tie steel or timber stringers together.

Prestressed concrete is not limited to use in bridges but has many other applications in railroad con-

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In The March Issue

1. Is it desirable to install treated hardwood and softwood ties indiscriminately in the same track? If so, explain. If not, why?

2. What are the advantages of using precast concrete slabs for walls and partitions in railway buildings? Disadvantages? Explain.

3. At what time, if any, should "frozen" joint bars be loosened? To what extent can it be done when bolts are being tightened out-of-face? Explain.

4. Is it practicable to straighten a pier or abutment that has developed a slight tilt? If so, what methods can be used? If not, explain.

5. To what extent, if any, would better lubrication of center plates and bearings of cars tend to minimize wear on the rails and wheel flanges? What other benefits might accrue? Explain.

6. How does plant control of water treatment for diesels compare in effectiveness and economy with manual application of chemicals? Explain.

struction. It can be used extensively in building work, such as for beams, girders, floor slabs, foundations and piles where it will have many of the same advantages found in its use in bridge construction. Furthermore, it can be used in precast products such as whistle posts, poles and posts.

The main obstacle to the use of prestressed concrete in this country at the present time stems from a lack of design specifications. Current practice is to design prestressed concrete according to existing specifications for reinforced concrete insofar as possible. Design requirements not covered by these specifications are being prepared. Another obstacle to the widespread use of prestressed concrete is the patented foreign equipment used for tensioning and fastening the prestressing wires. This situation is being relieved by the development of equipment and anchorages in this country. Still another obstacle is the use of low-slump, high-strength concrete which we are not accustomed to using. However, this type of concrete can be produced easily by giving more attention to mixing and placing practices.

We can sum up the advantages of prestressed concrete for railroad construction by saying that it saves critical materials, produces a better structure for many purposes, and within our limited experience in this country is often cheaper than other types of construction.

Best for Urban Bridges

By Division Engineer

From a casual study of widespread European practices and meagre information on uses in this country, it would appear, at this time, that prestressed concrete bridges lend themselves to locations where labor and supervision are comparatively cheap and structural materials are comparatively rare and costly. Also they meet situations where the depth of reinforced bridge members must be kept to a minimum and where more massive structures would be out of place from an aesthetic point of view. Probably no railway bridge in wide open spaces need be of prestressed concrete.

However, in urban communities, where lack of headroom and an abundance of aestheticism may be the order of things, prestressed concrete overheads and underpasses might well figure to be in the picture. Usually, such areas are congested and the handling of materials to and from the job-site is expensive. Thus, in such cases, any savings of mass to be handled is worth considering.

It is reported to take about ½ the amount of aggregate and about 1/3 the weight of reinforcing for a prestressed span as it would take for a regular reinforced concrete span serving the same purpose.

Prestressed members are usually precast and placed after seasoning, while ordinary reinforced concrete members may be cast in place if not loaded until they are seasoned. In some locations, these procedures may be in favor of ordinary reinforced concrete.

Any railway bridge is worthy of all the tests and inspections reasonably required and reinforced concrete is now placed with assurance that it will be what it is supposed to be. In prestressed concrete, the ducts and thin walls call for much care in pouring, and the placement of stressing members requires accuracy and skill, all of which may, or may not, be obtained in urban communities but may not obtain at all elsewhere.

When to Brace Shimmed Track

Under what conditions, if any, is it desirable to apply braces against the rails where track has been shimmed because of frost heaving? What precautions should be observed in applying such braces to assure maximum effectiveness? Explain.

Experience Wrote the Rules

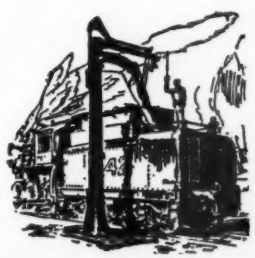
By Engineer of Track

Most railroads traversing territories subjected to extremely cold weather have long ago established definite practices for shimming tracks, the surface of which has become distorted by heaving. To most of the foremen on these lines, shimming is one of the necessary evils of winter maintenance and is taken in stride.

Experience has shown these men that, in shimming tracks, it is very important to spike-line the alinement rail and then gage the other rail to it. They know that shimmed track that is in poor line receives too much side thrust for braces or gage rods to withstand and hence is unsafe for scheduled speed.

It is a matter of habit for them to use standard hardwood shims in any of several combinations of shimming the track from ¼ in. to 2 in. For shimming 2¼ in. to 4 in. they customarily use 2-in. planks and shims on top of the planks. For shimming 4¼-in. or more they use 4-in. planks and shims on top. In all cases tie plates are placed on top of the shims.

The planks used for this purpose are generally as long as the ties, but when each rail has heaved unevenly, foremen habitually place these shims directly under the rails between the ties and the planks. When full-length planks cannot be used, planks at least 3 ft. long must be used with the outer ends placed even with the ends of the ties. All planks are nailed to the tie with four or more 8-in. wire spikes. Planks are bored with ⅝-in. diameter holes for spiking rails or shim braces.



It is a long-standing practice to use wood shim braces with track shims ¾ in. or more thick. These are fitted under the head of rail, and are held in place by two track spikes. Furnished in two sizes, either 12 in. or 14 in. long, these braces are applied to every second tie on curves, and to every third tie on tangents.

In shimming track it is also a matter of course for old foremen to apply gage-rods to assist in keeping the rails from spreading. On curved track shimmed from 1 in. to 2 in., four gage rods are applied to each track panel. On curves shimmed more than 2 in., six gage rods are installed per panel. On tangents, gage rods are not used unless the track is shimmed 1½ in. or more and then four rods are

used per panel. Occasionally a roadmaster may authorize the use of crossties in lieu of, or in addition to, gage rods.

Tracks shimmed and braced in accordance with these practices are safe as long as they remain in good line and surface. However, it must never be forgotten that heaved track is subject to change and for that reason must be watched carefully by foremen. If its changes do not permit it to be kept in good line and surface by shimming in the usual way, slow orders must be placed and allied instructions carried out to assure the safe operation of trains.

How to Keep Locker Rooms Sanatory

What are the most effective methods of keeping employee locker rooms and washrooms free of rodents and roaches? To what extent do structural features have a bearing on this problem? Explain.

Control Requires "Know How"

By Sanitary Engineer

Roaches and rodents can become quite a problem, especially in railway shop areas where the environmental conditions are what might be termed extremely favorable for them. Floors are sometimes oil soaked (food for roaches), corners are filled with dust and dirt, the lockers contain greasy clothing, there is spilled food on the floor and the building construction usually provides innumerable cracks and crevices for roaches to live and breed in. Furthermore, there is frequently a lack of adequate janitor service. When the pests get too bad, the local employees will attempt to control them by the conventional methods, such as sprinkling sodium fluoride and DDT powders around, or by baiting with old- and new-type rat poisons. The results of these efforts may be summarized by a statement frequently heard, "It helps for awhile, but they always come back." The remedy, of course, is: (1) To maintain clean environmental conditions, and (2) to apply proper and continuing control measures.

Keeping a railway-shop locker room clean is easier said than done. It requires cooperation on the part of employees as well as good janitor service. Too frequently those in immediate charge have to be more concerned about production than good housekeeping, notwithstanding the fact that the former can be greatly influenced by the latter. Approval for additional janitor service may be hard to secure.

Proper and continuing control methods require a certain "know how" and should be carried out by instructed personnel. Railroads having extensive pest control work to do should designate either system or division men to organize and supervise the work. To assist them, the techniques of applying the various types of powders, sprays or baits are outlined in many trade and public-health-service publications.

When planning a roach and rodent control program for railway locker rooms located near large cities, it may be possible to use the services of a local, professional insect-exterminator company. These outfits are organized, they have the equipment and the "know how," and generally guarantee results. Furthermore, their services usually cost much less than the wages of an extra janitor.

Must Keep Them Clean

By O. G. Wilbur
Assistant Engineer of Buildings, Baltimore & Ohio, Baltimore, Md.

It appears that one of the best methods of keeping rodents and roaches under control is to keep locker and wash rooms clean. Assigning to a laborer the duty of gathering up papers and discarded food is a good practice, as pests will not be attracted to a place if nothing is left there for them to eat.

Education of employees is helpful in keeping this problem under control. The placing of conspicuous signs in such places reminding those who use the facility to exercise care with paper and food and asking them to deposit waste materials in covered containers has proved effective. An appeal of this character will be recognized by most employees, and it is not unusual for the careful employees to be severely critical of the less careful.

It is also good practice to have available in the storeroom a small stock of poisoned seed and powder for application in the event pests appear. The prompt use of insecticides will be helpful in keeping such nuisances under control.

In construction it is desirable to keep the cracks where materials join of such character as to eliminate breeding areas. If floor construction can be used that will allow periodic washings with a hose, cleaning by such method is very desirable.

The application of ¾-in. mesh hardware cloth to the wall of a frame building arranged as a barrier extending from a tight floor to the roof will discourage rodents from entering a building used for storage of food stuffs. I do not, however, believe such construction is justified for locker and wash rooms.

Build Well, Keep Clean

By H. W. Van Hovenberg
Engineer of Tests & Sanitation, St. Louis Southwestern, Mt. Pleasant, Tex.

A most effective way of keeping employee locker rooms and washrooms free of rodents and roaches is to keep them scrupulously clean, well lighted, adequately ventilated and treated with DDT and Chlordane sprays at quarterly intervals or less. In those locker rooms that are used as lunch rooms by employees, the real problem is that of removing all food and food-wrapping debris.

Obviously, the structural features influence the degree of cleanliness that can be obtained and maintained as well as the cost of doing the cleaning. It is desirable to have smooth, impermeable floors, walls, and ceilings that can withstand modern, detergent cleaning solutions, and which have no cracks or crevices that can collect food scraps, dust or dirt. All openings into the rooms for lighting fixtures, water and steam pipes, etc., should be closed effectively against the ingress of rodents and insects. There should be a minimum of pictures, placards and other material attached to the walls. Mirrors should not be attached to the walls unless made integral with them. Bulletin boards, if used, can be held in frames about 4 in. away from the walls to facilitate cleaning.

Lockers should preferably be made of metal, and placed in rows away from walls. At fixed intervals all lockers should be examined, useless or discarded clothing and personal effects removed, and the interiors cleaned and sprayed. This procedure is particularly effective for controlling roaches and bedbugs.

Mice can be destroyed most easily by the use of baited traps. Furthermore, this method has the additional advantage that the rodents will not die and cause a bad odor in some obscure section of the premises as is usually the case when poison is used. For rats, commercial rodenticides (Warfarin preparations) are quite effective when used according to directions. Prepared bait can usually be secured locally through county farm agents, Wild Life agents and other outlets. To prevent rodent reinfestation, it is obvious that adjoining structures and areas must be kept clean with no possible sources of food available. The habitat of rodents will ordinarily be outside of the locker and wash rooms, and consequently, the baiting will be done along their avenues of access.

Although it may often seem a hopeless task to rid a badly infested premise of roaches, it has been done by continuous applications of DDT and Chlordane, but usually only after some attention to the structural features outlined above. By itself DDT can be quite effective at times, depending on the kind of roach. Our practice is to apply DDT (a 25 per cent water emulsifiable concentrate diluted with water to give a 5 per cent DDT solution) in hand sprayers using Spraying System's nozzel No. 8002. This DDT application is made to the walls, the undersides of benches, in and about lockers, and to all cracks caused by wall moulding, base boards, etc. It is followed by a spraying of Chlordane in the cracks, using not over a 2 per cent (commercial) solution. The combined use of DDT and Chlordane has been found quite effective. Professional pest exterminators are available almost everywhere. They should be contacted whenever local forces are not informed in such matters.

How to Weld Driver Burns Safely

To what extent, if any, has experience with the repair of driver burns by welding justified the continued use of this practice? What precautions have such experiences indicated are necessary? Explain.

No Service Failures Yet

By John P. Hiltz, Jr.
Engineer Maintenance of Way, Delaware, Lackawanna & Western, Scranton, Pa.

Our management approved the practice of repairing driver burns by acetylene welding in 1945. This approval was given following six years of extensive experiments and testing during which time it was proved that the practice was not only desirable but entirely safe. The tests included laboratory examination and analysis, detector-car examination, and service tests. We estimate that at least *one-half million driver burns* have been repaired by welding and to date we have *not had one service failure* which could be attributed to the practice, nor have we detected a defect under a welded burn with a detector car.

In initiating this practice we had the following objectives in mind: (1) To eliminate excessive track maintenance due to low spots in surface which developed under driver burns; (2) to eliminate the progressive type of rail failure which has been designated as an "engine-burn fracture" and which is caused by the repeated high impacts to which the rail is subjected when car and engine wheels encounter the irregularity in rail surface which attends a driver burn; and (3) to provide a smooth, symmetrical rail head which can be tested by a detector car.

Our instructions governing the method to be used are:

(1) All damaged rail metal shall be removed from the driver-burned area by grinding. Special care shall be exercised to see that sufficient metal is removed to eliminate all shatter cracks in the rail. Any rail having a shatter crack extending more than ¾ in. from the top of the rail under the burn shall be removed from track as soon as possible.

(2) The area to be welded, together with the parent metal surrounding the area for ½ in. on all sides, shall be preheated to a dull red before any metal is deposited. During this preheating, the welder should carefully examine the ground-out area to ascertain whether any additional shatter cracks open up. If any are found, the grinding operation should again be performed to the depth of the shatter crack before depositing any metal.

(3) Oxweld MW metal or equivalent, should be deposited in the usual manner. In the case of small burns, the metal should be deposited as slowly as possible and heat allowed to "soak" into the rail.

(4) A hard deposit of weld metal in a driver burn is objectionable. The weld metal should be as close to the hardness of the parent rail steel as it is possible to obtain, but in any case should not be more than 40 points Brinell higher in hardness than the parent rail steel. Frequent Brinell readings should be made to assure that this condition is obtained.

(5) To obtain this condition it is necessary to allow the welded metal to cool as slowly as possible. Therefore, the rail head, web, and base around the welded metal should be post-heated to a dull red color to the extent necessary. In no case shall the combined time of welding and post-heating *be less than 10 min.*

(6) The welded area, after cooling, should be ground to a *true straight-edge surface* with the parent rail, and grinding "gouges" or "nicks" eliminated to the best possible extent. Any irregularity in surface will set up a pounding of the wheels which will be accentuated more and more as the hardness of the irregular surface is increased due to "work hardening." "Gouges" and "nicks" prevent a true detector-car test in that this irregularity in the rail-head surface will set up an indication on the recording tape.

Be Sure to Reheat

By R. W. Torbert
Manager Maintenance of Way and Construction Department, Oxweld Railroad Service Company, Chicago

If the number of driver burns on one rail number four or less, and if they are no deeper than ¾ in. a railroad is justified in building up the burns by welding.

It is our recommendation that the rail first be preheated near the burn to approximately 500 deg. F. prior to the use of an oxyacetylene gouging nozzle to remove all cracked and defective metal. In our wide experience in working with railroads on this problem, we have found that by using a gouging nozzle to remove defective metal, a smaller amount of sound metal is removed than with the use of a grinding wheel.

Our third and most important recommendation is the reheating of the built-up area to a temperature between 1600 and 1800 deg. F. This heating is only needed in the rail head to recrystallize the weld

area. In most cases the heating should be extended below the rail head to prevent dipping of the rail. Finally we specify that the area be slow-cooled by placing insulating material around the heated area below the rail surface.

Our specific instructions include the following:

(1) Use slight excess of acetylene flame in which the excess acetylene feather is about 2½ times the length of the inner cone, both measured from the end of the welding tip.

(2) Apply the weld metal as in a normal fusion weld, a puddle being developed at one portion of the rail and carried progressively to the completion of the weld. A hammer may be used to roughly shape the applied metal.

(3) After the metal has been allowed to cool to a black heat—similar to the process used in making hand butt welds—the rail should be normalized by reheating and slow cooling as given above. This torch normalizing is only needed in the rail head to recrystallize the weld metal but may be extended for the full depth of the rail if necessary to prevent dipping of the rail.

Scrap Driver-Burned Rail

By Division Engineer

For a time before, and during World War II, new rail was scarce. Coincidentally traffic, operating conditions and, in some cases, the personnel on locomotives caused many driver burns on running rails. Thus from sheer necessity, many of those driver-burned rails could not be scrapped and some other method had to be developed for utilizing them.

To weld driver-burned rails in high-speed tracks was considered bad practice at that time because fissures had developed in the vicinity of some welded burns. The general practice was to change out badly burned rails from important tracks and relay them in auxiliary tracks. As driver burns caused loose and pumpy track which is expensive to maintain even in secondary tracks, economic considerations determine whether driver-burned rails should, or should not, be welded.

During the war, it was found that, on the average, it cost 87 cents per burn to smooth up the heads of driver-burned rails by welding. In important auxiliary tracks, it was thought necessary to apply used joint bars, with two old bolts and nuts without washers, under the welds in case fissures should develop. The use of such old bars at welds adds about threefold to the costs and is justified only at special locations.

At one such location more than 100 welds were made and old joint bars applied at the welds. To date there have been two cracked-out fissures at the welds. This would indicate that both the welding and the barring was justified.

Generally, driver-burned rails should be changed out from important tracks and used in auxiliary tracks if scarcity of rail and other conditions justify.

Remotely Controlled Switch Heaters

How should snow-fighting forces be organized to service remotely controlled switch heaters at interlocking plants? At C.T.C. switches? How many men, if any, are necessary?

Fewer Men Needed

By Roadmaster

The answer to this question is not an easy one. Snow fighting methods differ widely in the various sections of the country and often on the same railroad. Although geological location generally influences the severity of storms and, therefore, the ways of handling them, there are several important basic features of each method which must be followed for all storms.

One of these is preparation. Advance work is first in importance in preparing switches to receive snow. Too many times this is either left undone or is done too late. The tie cribs throughout the length of the switch points must be dug out to receive the maximum amount of snow before it fouls the point.

If gas heaters are used, they must be properly cleaned and checked for broken ceramics and fouled burner tips, etc. Where electric heaters are applied all electrical connections to the heaters must be checked to be sure that the heaters are working efficiently. Either type must be operated before the first storm to assure that all is in order.

The second basic factor common to all storms is organization. A snow-meeting with all foremen, all other possible leaders, and key laborers who may be called upon to handle snow conditions, is held in early October to assign men to work the different locations. This feature is more important in large terminals than at remote, small stations and junction points. These assignments are made so that when a storm hits the area, there will be no possibility of confusion as to who is to go where and why.

This meeting is held also to designate responsibility for the area and how it is to be handled. Improvements from year to year in snow fighting equipment make these meetings very important. A roadmaster or supervisor has a splendid opportunity of telling the men assigned what and how much is to be taken care of. An alternate is also named for the man assigned to each location. This alternate will take over if the regularly assigned employee is not available. This helps in setting up relief forces in storms of long duration. These assignments are based on a normal snowstorm. Extraordinary storm conditions are handled by the roadmaster and supervisor.

On remote-control switches in a remote area the assignment of any man depends on the distance he would have to go in case of any trouble. By trouble we mean many things, such as ignition failures, ice and hard snow falling from cars passing over the switch points, snow drifting fast enough to render the heater inefficient, part of heater not operating and many other little bugs which still have to be overcome. For such contingencies, I feel that one man should be available either at each C.T.C. location or nearby where he can get to the switch in a short time.

At interlocking plants there is usually other work of importance that has to be done. For instance, pipe lines have to be cleaned at old manually operated plants, while at pneumatic plants small yards or junction tracks are often nearby that require attention. In such cases, two men can be assigned to take care of the lines or yard switches. When neither of the above conditions exist one man should be available to standby for an emergency. We have on our railroad two interlocking plants within 1½ miles of each other with an average of about 12 interlocking switches and several derail

(Continued on page 1132)

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switches. In a normal snowstorm, a foreman and one man with a truck can take care of both plants, running back and forth between them if necessary. Assigning men to any location depends on existing conditions and I believe these are local and should be handled accordingly.

A Few Men Are Essential

By A. G. Reese
District Maintenance Engineer, Chicago, Burlington & Quincy, Galesburg, Ill.

The wording of the question seems to refer to gas heaters which are turned on and ignited from a distant point, such as at the dispatcher's desk or an interlocking tower. Theoretically, no men should be required to service remotely controlled switch heaters during a snowstorm, but experience shows that inspection and adjustment is essential to assure proper performance.

This inspection and adjustment should start at the end of the previous winter. A minute check of equipment should be made and necessary repair or replacement parts ordered promptly to be sure of delivery in ample time for use in advance of the next winter season. In the early fall, the gas supply should be checked for adequate pressure, and where bottled gas is used, it should be assured that tanks are fully charged and working valves and igniters are in good working condition. All installations should be tested at intervals throughout the winter season to guarantee prompt and adequate service when needed. The foregoing preparatory work, if adequately carried out, will go far toward reducing failure of equipment and resultant increase in labor expenditures to keep switches free of snow and ice.

It is the usual practice each year for the roadmaster or one of his assistants to assign definitely a man or men to assume the responsibility for inspection, operation and maintenance of the switch heaters at various locations, and the dispatcher or tower operator is informed of the assignments so that at the beginning of a snowstorm, a call can be placed to the particular man required at the moment. This is usually at the time a snowfall is reported at a particular location and the switch heaters are turned on and ignited.

At interlocking plants where a considerable number of switches and switch heaters are grouped within a limited area, one to three men can usually take care of all the work incident to a storm of short duration. However, if the storm period is extended, relief men are provided. The plant is patrolled at frequent intervals to prevent any interruptions of operation due to high winds, passing of high-speed trains, falling ice striking heaters, etc.

At remote C.T.C. switches the conditions are different since it is not possible to assign a man to handle more than one switch on account of the intervening distance between switches. Here, the man moves to his assigned position and remains there until relieved. Inspection and maintenance are taken care of and conditions are reported to the dispatcher at frequent intervals. This report is very essential since this man is alone at a remote location and assurance of his safe condition is important. A telephone with a call light on the front of the shelter house at the switch location is provided for his protection and communication.

The above is based on the premise that there will be no damage to the installation by dragging equipment or from some other cause. Should this occur it will be necessary to call out adequate forces to keep switches clear of snow with brooms, shovels, weed burners, snow blowers, etc. This equipment is usually conditioned and assigned prior to the season of winter snows.

Pumping Lubricating Oil to Diesel

What are the relative advantages of remote push-button stations and automatic pressure systems for pumping lubricating oil to diesel locomotives? What are the characteristics of each method? Explain.

Suit the System to the Site

By G. F. Metzdorf
Designing Engineer, New York, Chicago & St. Louis, Cleveland, Ohio

In a system manually operated by a remote push-button station, there is always a possibility of man failure, even when the switch is provided with an indicator light warning the operator to shut off the pump when the lubricating operation at a station is completed. Although the pump is provided with a relief valve and bypass to release the built-up pressure in the line when outlet valves are shut off and the motor continues to operate, the operation under this condition will cause the pump motor to work against a higher working load. This extra load and the unnecessary operation of the motor is a waste of power and if allowed to run continuously, particularly under a high relief valve setting for a long period of time, may cause the motor to burn out.

For small installations having only one or two stations and where the pump is in view or in a location where it is frequently passed by the operator, a push-button station with or without indicator lights would be a suitable and less expensive installation.

At oiling stations where the pumping installation would be located in a remote section of the building or in a separate building, it is necessary to have automatically controlled pumping facilities to eliminate man failures in the pumping control operation.

Selecting the type of automatic-control system is a matter of economy. In making the selection, consideration should be given to the amounts and frequencies of crankcase oil fillings, convenience of station operation, and maintenance of the control system. The working periods or watchman's service should also be given consideration.

Should a hose connection let loose or a leak develop under a continuous pressure system during an off working period, there would be a great loss of oil and this would create a possible fire hazard. For a single-outlet station with a remote pumping installation, the selection would normally be a push-button station with a timing shut-off switch.

The selection of the continuous pressure-type system would conceivably be made when its cost is estimated to be less than the cost of a push button-timer shut-off switch installation, contingent on the previously-mentioned considerations.

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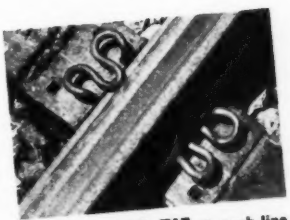

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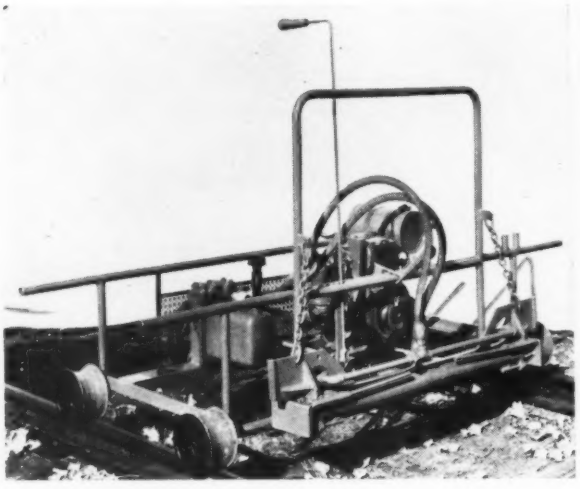
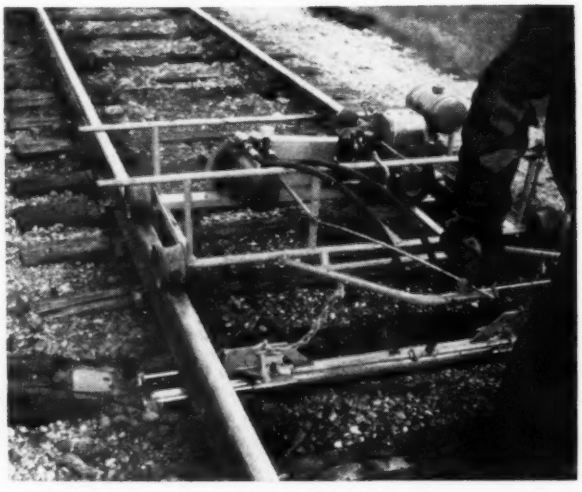




TIE-END REMOVER

IN tie-removal work the task of removing the old ties without trenching or jacking the track is frequently carried out by sawing each of them into three pieces with the Woolery Tie Cutter, manufactured by the Woolery Machine Company, Minneapolis, Minn., and then pulling out the pieces separately. Although this method simplifies the overall task and produces cost savings, the work of removing the end pieces, which extend under the rail, is sometimes not an easy task, particularly in track with heavy rail and double-shoulder tie plates.

However, the Woolery Machine Company reports that the work of removing the tie ends has been greatly simplified by a new machine, designed for use with the tie cutter, which permits one man to remove both end pieces simultaneously in about 30 sec. with the expenditure of no more effort than that required to turn a valve. The new machine, called the Woolery Tie-End Remover, consists essentially of a double-ended hydraulic cylinder mounted in a horizontal position at right angles to the track on one end of a steel frame with four double-flanged wheels. The cylinder pistons are actuated by a hydraulic pump driven by a Wisconsin air-cooled engine.

In tie-removal work here is how the two machines are operated. After a tie has been cut on both sides with the tie cutter, the operator of the tie-end remover moves up to the cut tie, lifts out the center section with a pair of tongs, and lowers the hydraulic cylinder into the tie bed. Then he opens a valve, which causes the pistons to move outward and push the tie ends clear of the rails. The pistons exert sufficient force to push out the tie ends regardless of the weight of rail or type of tie plates, and no jacking or trenching is necessary. The tie-end remover is worked closely behind the tie cutter so that the operators can assist each other in removing the machines from the track to clear trains.

NEW CHEMICAL FOR "ERASING" WEEDS

E. I. DU PONT de Nemours & Co., Inc., Wilmington, Del., has developed a new non-selective chemical weed killer, known as CMU, which is reported to "erase" dense growths of mixed grasses and broad-leaf weeds, leaving only an expanse of bare soil. After application the chemical becomes absorbed in the root systems of the plants, then moves upward into the foliage. First the leaf tips begin to die, next general discoloration of the foliage occurs, then plant growth slows to a stop, and finally the plant dies.

The chemical is relatively non-volatile, and can be applied as a spray. According to the manufacturer, it is not flammable or corrosive, and is non-toxic to warm-blooded animals.

During the past year Du Pont has conducted extensive tests of the material under a wide range of field conditions. Now under way are still other tests to determine the duration of soil sterility produced by CMU in various types of soil. So far, the chemical has been produced only in small quantities for test purposes. During 1952, however, a limited amount of it will be available for commercial use.

THE MONTH'S NEWS
Railway Personnel

General

Alfred James, Jr., trainmaster on the Louisville & Nashville, and formerly an assistant engineer in the bridge department, has been promoted to assistant superintendent, with headquarters as before at Louisville, Ky.

Sidney M. Rodgers has been appointed general manager of the operating, mechanical and maintenance departments of the Rutland at Rutland Vt., a newly created post. Mr. Rodgers, a graduate of Princeton University, entered railroad service in 1934 with the Pennsylvania after graduate study at the Yale University

Sidney M. Rodgers

School of Transportation. He served the Pennsylvania as division engineer on the Eastern region at Williamsport, Pa., and on the Western region at Toledo, Ohio. During the past year Mr. Rodgers has been assistant engineer in the office of the chief engineer maintenance of way of the Pennsylvania at Philadelphia. In 1946 he had a special duty assignment in the P.R.R.'s main accounting office to make a detailed study of methods and procedures of accounting in audits of disbursement and passenger and freight traffic. Concurrently he worked in the comptroller's office preparing estimates and budgets.

Engineering

Luis deMartorell, supervisor of track on the Erie at Dunmore, Pa., has been promoted to assistant division engineer at Salamanca, N.Y.

D. B. Packard, special assistant engineer on the Atlantic Coast Line, has been appointed engineer of buildings, with headquarters as before at Wilmington, N.C.

R. E. Loomis has been appointed assistant to chief engineer of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill.

(*Turn to page 1136*)

Railway Personnel (Cont'd)

E. H. Lundin, assistant chief engineer of the Rutland at Rutland, Vt., has been temporarily appointed chief engineer.

Lee W. Howard, assistant valuation engineer of the Illinois Central, has been promoted to valuation engineer, with headquarters as before at Chicago, to succeed **C. C. Haire,** who retired on October 15.

J. R. Leguenec, bridge and building supervisor on the St. Louis Southwestern, has been promoted to division engineer, with headquarters as before at Tyler, Tex. He succeeds **J. F. Montgomery,** who has retired after more than 31 years of service.

R. M. Smith, whose promotion to district engineer, Western district of the Missouri Pacific at Kansas City, Mo., was announced in the November issue, was born at Imperial, Neb., on December 20, 1889. He entered the service of the Missouri Pacific as a rodman at Falls City, Neb., in 1912 after his graduation from the University of Kansas. During the ensuing years he served as a transitman at Falls City and at Osawatomie, Kan., and as assistant engineer at Coffeyville, Kan., Osawatomie, Falls City, and in the valuation department at St Louis, Mo. Late in 1924 he was promoted to assistant division engineer at Hoisington, Kan., and between May 1925 and May 1929 he was division engineer at Van Buren, Ark., and at Wynne, Ark. On the latter date he became assistant engineer maintenance of way at St. Louis. In May 1933 Mr. Smith entered the operating department, serving successively as assistant superintendent at Pueblo, Colo., trainmaster at Bush, Ill., and assistant superintendent at Wynne. In February 1944 he returned to the engineering department as division engineer at Wichita, Kan., where he served until July of this year, when he was appointed division engineer of the Omaha and the Northern Kansas divisions. It was from the latter post that he was promoted to district engineer.

N. E. Peterson, engineer maintenance of way of the Chicago & Illinois Midland, has been promoted to chief engineer, with headquarters as before at Springfield, Ill.

C. S. Kirkpatrick, whose retirement as chief engineer of the Missouri Pacific Lines in Texas and Louisiana was reported in the October issue, began his railroad career with the Missouri & North Arkansas (later the now defunct Missouri & Arkansas), in 1901. He subsequently held positions with the Houston & Texas Central (now Texas & New Orleans), the St. Louis & San Francisco (now St.L.-S.F.), and the Guggenheim Exploration Company. In 1913 he was appointed chief engineer for the Cape Girardeau & Northern (since abandoned), and from 1914 to 1926 he served as chief engineer for the Gulf Coast Lines of the M.P. In 1926 he was appointed chief engineer for the Gulf Coast, the International-Great Northern and several other subsidiaries of the M.P.

C. S. Kirkpatrick

Karl Huffman, whose promotion to chief engineer of the Central region of the Canadian National at Toronto, Ont., was reported in the September issue, was born at Toronto on May 12, 1889, and was graduated from the University of Toronto, Faculty of Applied Science, civil engineering, in 1911. During summer months while attending the university, Mr. Huffman was employed on location surveys for the Temiskaming & Northern Ontario (now Ontario Northland) and in the Toronto engineering-drafting department of the Canadian Northern (now Canadian National). He was also identified with land surveys for the Department of the Interior, establishing

land lines west of Edmonton, Alta., so that railway lands and coal claims could be granted by the Crown. He obtained his certificate as a Dominion land surveyor in 1913 and as an Ontario land surveyor in 1914. Mr. Huffman commenced service with the C.N. in January

Karl Huffman

1912 in the engineering department, on railway location and land surveys, subsequently becoming assistant division engineer and division engineer, successively, of the Capreol division. In February 1940 he was appointed engineer of construction and fire prevention of the Central region at Toronto, in which capacity he served until his recent promotion.

E. D. Billmeyer, whose promotion to division engineer of the Western Maryland at Cumberland, Md., was announced in the October issue, was born at Cumberland on February 21, 1907, and was educated at Tri-State College of Engineering, from which he received a Bachelor of

E. D. Billmeyer

Science degree in civil engineering in 1928 and a Civil Engineering degree in 1945. He entered railway service in August 1928 as a levelman on the Pittsburgh & West Virginia, later becoming draftsman and assistant engineer. He left railway work in 1931 to engage in highway and building construction, and in January 1937 he entered the service of the Western Maryland as an assistant engineer, later becoming resident engineer at

(Continued on page 1138)

Railway Personnel (Cont'd)

Hagerstown. Subsequently he served at Baltimore and Cumberland as chief draftsman, office engineer and assistant engineer. In September 1949 he was promoted to assistant division engineer at Cumberland, which position he held until his recent promotion.

H. O. Waddell, whose appointment as district engineer of the Northern Ontario district of the Canadian National at North Bay, Ont., was announced in the September issue, was born at Port Hope, Ont., and entered railway service in November 1930 as an instrumentman on the Canadian National at London, Ont. He later served with the Toronto Terminals Railway Company and then returned to the C.N.R. In 1936 he was advanced to assistant engineer at Toronto, later being transferred successively to Capreol, Ont., Allandale, Ont., and the Toronto Terminals. In June 1945 Mr. Waddell was promoted to assistant division engineer at London, and was appointed division engineer of the Toronto Terminals division in 1946, which position he held until his recent promotion.

Frank J. Farish, whose appointment as division engineer on the Canadian National, with headquarters at Calgary, Alta., was noted in the September issue, was born at Moose Jaw, Sask., on June 19, 1915, and was graduated from the University of Manitoba with the degree of Bachelor of Science in civil engineering in 1943. Mr. Farish began service with the C.N.R. in May 1948 as assistant engineer in the bridge department at Winnipeg, Man., and during the period from May 1950 to the following August, was in charge of a party making a study of betterments on the Kamloops division, with headquarters remaining at Winnipeg. In the latter month he was appointed assistant to the district engineer at Edmonton, Alta., and retained that position until his recent promotion.

Track

J. H. Keays, roadmaster on the Canadian National at Campbellton, N.B., retired recently after 37 years of service, and **J. A. E. Melanson,** roadmaster at Moncton, N.B., has retired after 42 years of service.

William B. Hosp, inspector in the office of manager roadway maintenance on the Norfolk & Western, with headquarters at Roanoke, Va., has been promoted to the new position of assistant roadmaster on the Pocahontas division, at Bluefield, W. Va.

William Baerthlein, assistant supervisor of track on the New York Central at Buffalo, N.Y., has been promoted to supervisor of track on sub-division 27, Pennsylvania division, with headquarters at Clearfield, Pa.

Edward S. Cole, assistant supervisor of track on the Southern at Birmingham, Ala., has been promoted to supervisor of track at Mt. Vernon, Ill. **Allen P. Bowen,** supervisor of track at Birmingham, has

been transferred to Ludlow, Ky. **George C. Smith,** supervisor of track at Winston-Salem N.C., has retired after 38 years of service. Mr. Cole was born at Knoxville, Tenn., on August 2, 1910. Beginning his service with the Southern as a track laborer at Pruden, Tenn., he subsequently served in various capacities at Asheville, N.C., Chattanooga, Tenn., Knoxville, and Danville and Clarksville, Va. He was appointed assistant supervisor of track at Birmingham last July.

H. Anderson, roadmaster on the Canadian Pacific at Vancouver, B.C., retired recently after more than 44 years of service.

L. J. Shea, supervisor of track on the Jersey Central Lines at Ashley, Pa., has been transferred to Allentown, Pa., to replace **J. W. Rementer,** who has been assigned to special duties. **Gabriel Gyenes,** assistant supervisor of track at Sommerville, N.J., has been promoted to succeed Mr. Shea, and **Ronald Warner,** whose position as general foreman of track has been abolished, has been appointed assistant supervisor of track to succeed Mr. Gyenes. **Joseph P. Leahy** has been appointed supervisor of track at Allentown to replace **N. A. Camera,** who has been transferred to the Allentown yard improvement project. The headquarters of supervisor of track, sub-division No. 1, have been transferred from Mauch Chunk, Pa., to Allentown.

L. E. Porter, whose appointment as roadmaster on the Chicago, Rock Island & Pacific was announced in the November issue, was born at Fairmount, N.D., on Oct. 7, 1923. He obtained his higher education at the North Dakota State Teachers College and at Aurora College, and entered railroad service in November 1948 as an assistant on the engineering corps of the Chicago & Eastern Illinois. Mr. Porter was promoted to assistant track supervisor on the C. & E. I. in May 1950 and served in that capacity until his appointment as roadmaster on the Rock Island on October 15.

Clyde L. McElheny, whose promotion to supervisor of track on the Pennsylvania at Carrothers, Ohio, was reported in the September issue, was born at Hessdale, Pa., on February 19, 1917. He entered the employ of the Pennsylvania as a trackman at Lancaster, Pa., on March 12, 1937, subsequently serving as assistant foreman at Lancaster, foreman at Columbia, and general foreman at Chambersburg, Pa. On November 1, 1947, he was appointed assistant supervisor of track at Williamsport, Pa., and later served in that capacity at Oil City, Pa. Mr. McElheny was transferred to Trafford, Pa., on August 14, 1949, and remained there until his recent promotion.

Bridge and Building

The Jersey Central Lines have announced that the headquarters of the master carpenter have been transferred from Mauch Chunk, Pa., to Allentown, Pa.

David C. Kreigh has been promoted to general foreman of bridges and buildings

(Continued on page 1140)

Railway Personnel (Cont'd)

and water service on the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., succeeding **George R. Collier,** who has been transferred.

B. H. McGrew, assistant bridge and building supervisor on the St. Louis Southwestern, has been promoted to bridge and building supervisor, with headquarters as before at Tyler, Tex. He succeeds **J. R. Leguenec,** whose promotion to division engineer is reported elsewhere in these columns. Mr. McGrew obtained his higher education at the Tyler Junior College, The Texas Agricultural and Mechanical College, and Rice Institute. He began service with the Cotton Belt in 1942 as a messenger-caller, and became a chainman in the engineering department later in the same year. After serving with the armed forces from 1943 to 1946, Mr. McGrew returned to the Cotton Belt as a rodman at Tyler. He was promoted to junior transitman in 1947, and to assistant bridge and building supervisor early this year.

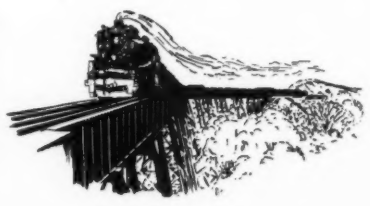
J. J. Brandimarte, assistant supervisor of structures on the Lake division of the Pennsylvania, has been promoted to supervisor of structures on the same division, with headquarters at Cleveland, Ohio, succeeding **A. R. DeWalt,** who has been assigned to other duties. Mr. Brandimarte is succeeded as assistant supervisor of structures by **J. R. Flack,** junior engineer on the Philadelphia Terminal division.

Obituary

Charles E. Bain, retired supervisor of bridges and buildings on the Hocking division of the Chesapeake & Ohio, died recently at the age of 81.

Henry A. Chandler, retired division engineer on the Canadian Pacific at Woodstock, B.C., died recently at the age of 76, and **Duncan D. MacCrimmon,** who retired in 1945 as an engineer on both construction and maintenance work in various departments of the railroad, died recently at Cornwall, Ont., at the age of 72.

Meyer Hirschthal, who retired as concrete engineer on the Delaware, Lackawanna & Western in 1949, died suddenly on October 15. Mr. Hirschthal was born at Cracow, Poland, on December 12, 1879, and attended the City College of New York and Columbia University. He started his railroad career in the engineering department of the D. L. & W. in 1907 and became concrete engineer in 1920. Since his retirement he had been engaged in consulting work at New York.



Association News

Roadmasters' Association

The Executive committee of the association will hold a meeting at the Engineers' Club, Chicago, on December 11, under the direction of President A. H. Whisler. The most important item on the agenda will be the selection of the personnel of the committees that are to prepare technical reports for presentation at the annual convention in September, 1952. Also to be considered at the meeting are reports of various standing committees, such as those on Membership and Convention Proceedings, as well as other routine business.

Maintenance of Way Club of Chicago

The club held its second meeting of the current season on November 26 at Eitel's restaurant in the Field Building, Chicago. The subject of the program was "Mutual Maintenance Problems of the Track and Signal Departments." The side of the track department was pre-

(Continued on page 1142)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 11-13, 1952, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual meeting, April 22-24, 1952, Hotel New Yorker, New York. H. L. Dawson, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—Next meeting December 17. E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliances Association—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Roy M. Edmonds, Secretary-treasurer, 912 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 15-17, 1952, Conrad Hilton (Stevens) Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

sented by W. H. Huffman, division engineer, Chicago & North Western, and that of the Signal department was presented by H. T. Fleisher, signal engineer of the same road.

Bridge and Building Association

Under the direction of President Guy E. Martin a meeting of the Executive committee of the association was held at the St. Charles hotel, New Orleans, La. on December 4-5. The principal item of business transacted at the meeting was the selection of the personnel of the committees that are to prepare technical reports for presentation at the 1952 convention. Also given consideration at the meeting were a number of new membership applications, the organization of a campaign to obtain new members, and ways and means for increasing the sale of advertising in the association's 1951 Proceedings.

Metropolitan Maintenance of Way Club

The annual luncheon meeting of the club will be held at the Hotel Shelburne, New York, on December 6, at 12:30 p.m. The principal speaker will be J. B. Akers, chief engineer of the Southern, who will give a talk on "Materials and Methods in Maintenance of Way."

American Railway Engineering Association

Formulations of plans for the next convention to be held at the Palmer House, Chicago, on March 11-13, 1952, got well under way on November 8, at a meeting of Arrangements committee, held at association headquarters at Chicago. On the following day the Board of Direction met and considered a large amount of routine business. In the afternoon the Board received the report of the Nominating committee which had met in the morning of the same day.

Supply Trade News

General

Chipman Chemical Company, Inc., has established new railroad division headquarters at 1116 Transportation Building, 608 South Dearborn Street, Chicago 5. **A. J. Reading** is manager of the division.

The **Pacific Coast Borax Company** has appointed the **Chapman Chemical Company,** Memphis, Tenn., as a distributor of its weed and grass-killing products "Borascu" and "Polyborchlorate 88." Distribution arrangements cover all parts of the United States except the Pacific Coast.

Personal

Charles F. Palmer has been elected president of the **Peerless Equipment Company,** a subsidiary of **Poor & Co.,** with headquarters at Chicago. He succeeds **William E. Gray,** who has resigned.

J. R. Coffing, general sales manager of the **Coffing Hoist Company,** Danville, Ill., has been elected vice-president in charge of sales, advertising and general office administration.

W. G. Turner, regional manager of the Southeastern region of the **Cummins Engine Company, Inc.,** with headquarters at Atlanta, Ga., has been transferred to Cleveland, Ohio, where he will be in charge of the Great Lakes region.

D. V. Perry, Eastern district manager of the **DeVilbiss Company,** at Newark, N.J., has been appointed assistant sales manager of the company's spray painting and finishing division, with headquarters at Toledo, Ohio. He is succeeded as Eastern district manager by **C. B. Gracely,** manager of the DeVilbiss office at Houston, Tex.

Don C. Smith has been named sales manager of the Pittsburgh (Pa.) district of the Wood Preserving division of **Koppers Company, Inc.** Mr. Smith was formerly sales manager of the New York area of the division, in which position he has been succeeded by **Don F. Taylerson,** formerly sales representative in the Pittsburgh district office.

R. A. D'Amour and **G. W. Plondke**, formerly sales engineers for the **Cummins Engine Company**, Columbus, Ind., have been appointed assistant regional managers Washington, D.C., region and Central region, respectively.

Mr. D'Amour was graduated from Michigan College of Mining and Technology, Houghton, Mich., with a degree

R. A. D'Amour

in mechanical engineering in June 1948 and in August of that year joined Cummins as a trainee engineer. He was appointed a sales engineer in May, 1949.

Mr. Plondke was graduated from George Washington University, Washington, D.C., in June 1948, with a de-

G. W. Plondke

gree in mechanical engineering. He joined Cummins at that time and following a trainee period was appointed sales engineer in February 1949.

B. C. Tracey, manager of accessories and renewal parts sales of the welding department of the **General Electric Company**, has retired. Mr. Tracey joined General Electric in 1918.

J. T. Carroll has been appointed assistant manager of the Chicago district office of the **Worthington Pump & Machinery Corp.**, to succeed **J. B. Laramy**, who has been appointed manager of the marketing research department.

(Please turn to page 1144)

Supply Trade News (Cont'd)

The **Dearborn Chemical Company, Ltd.,** has appointed **Dr. William A. James** as director of research, and **Jerry Shaw** as sales representative. Dr. James will assume charge of all research activities at the Dearborn Laboratories, 2454 Dundas Street, West, Toronto, Ont. For the time being Mr. Shaw will also have headquarters at Toronto.

The **Sherwin-Williams Company** has created three new transportation sales territories: northern California, southern California and Ohio-Michigan. **W. R. Clark** has been appointed transportation sales representative for the Ohio-Michigan area, with headquarters at Cleveland, Ohio. **E. S. Dean** will have charge of the northern California area, working out of Oakland, Cal., and the southern California territory will be under **T. A. Jordan,** in Los Angeles, Cal.

The Taylor-Wharton Iron & Steel Co. has announced the promotion of **Ralph G. Detmer** to the position of vice-president, Trackwork division, with headquarters at Cincinnati, Ohio. Mr. Detmer began his career with the Weir Frog Company. In 1921 he joined the staff of the American Frog and Switch Company, becoming general manager in 1930 and vice-president and general manager in 1943. Since 1949, when Taylor-Wharton and its wholly owned subsidiary, The American Frog and Switch Company, consolidated with the Weir Kilby Corporation, Mr. Detmer has held the position of assistant to the president, sales and engineering.

L. S. Heasom, assistant to vice-president of the **National Aluminate Corporation,** has been promoted to assistant vice-president; and **R. G. Bielenberg,** assistant manager railway service, has been promoted to manager railway service, both with headquarters at Chicago.

T. H. Way, who has been appointed assistant vice-president of the Pullman-Standard Car Manufacturing Company. He will have charge of manufacturing at the Hammond (Ind.) and the Rockford (Ill.) plants of the company.

Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 1095)

Railway Maintenance Paints—The McDougal-Butler Company, Inc., has issued a folder describing its complete line of paints for railway buildings, bridges, signals and roadway equipment. Included in the folder is a separate bulletin which takes the reader on a pictorial journey through the company's paint and varnish factory at Buffalo, N. Y.

Multi-Purpose Earthmover—The Caterpillar Tractor Company is offering a folder describing its No. 10S bulldozer, which is specially-designed for mounting on the Caterpillar DW10 tractor. Included in the folder are specifications, operating data, and on-the-job photographs.

Tractor-Shovels—The Frank G. Hough Company has published a 12-page catalog on its complete line of Payloader tractor shovels. Entitled "Profitable Construction with Payloaders", the catalog gives the features and specifications of the machines, and presents numerous photographs of the units working on a wide variety of earthmoving, materials-handling, lifting and carrying job. Also included is data on such accessories as backfill blades, crane hooks, snow plows and fork lifts.

Heavy-Duty Excavator—The Koehring Company is offering a new catalog describing the latest advancements that have been incorporated in the Koehring Model 304 and its attachments. The booklet, printed in two colors, contains 117 illustrations and drawings depicting the design features, construction, work capacity and applications of this machine.

How to Design for Nelwelding—This is the title of an eight-page manual prepared by the Nelson Stud Welding division of Gregory Industries, Inc., as a guide for designers and engineers in the use of the Nelweld process for applying fastenings to steel. The manual gives stud specifications, stud-selection guides, a table of minimum stud clearances applicable to the portable Nelson stud-welding gun, and detailed suggestions concerning template design and provisions for accommodating fillets.

Equipment for Railroad Liquids—Bowser, Inc., is offering a 24-page catalog on its line of equipment for handling oils, paint oils and liquid fuels. Included in the catalog are illustrations and descriptive data covering such items as fueling systems for diesel and gas-electric locomotives, systems for unloading and storing fuels, lubricating-oil systems, printing delivery systems for accounting control, metering equipment and accessories, rotary power pumps and accessories, barrel and can-filling units, Serv-A-Train fueling units, cartridge filters, unloading and fueling equipment for oil houses or supply cars, lubricating oil and paint-oil outfits, and fog fire-fighting equipment.

Electric Stairways—A booklet of useful information about the Electric Stairway and its function in providing convenient and economical vertical transportation has been published by the Westinghouse Electric Corporation. In the opening pages of the booklet the reader is introduced to the stairway through a cutaway view in which every important part is identified. There follows a discussion of the functions of these parts, which includes information on how they are produced. Other sections of the booklet give data on stairway sizes, prices, applications, arrangements and layouts. The concluding portions tell how the stairways fit into programs of building modernization.

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